

HP ProLiant Essentials Rapid Deployment Pack—Linux Edition User Guide

Release 1.00



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About This Guide

This guide provides information for using the Rapid Deployment Pack as a server deployment solution. This guide:

- Introduces the Web console, its basic functionality, and ProLiant-specific features
- Describes the directory structure and files provided with each ProLiant Integration Module component and their respective uses
- Provides example deployments

Audience Assumptions

To install and configure the Rapid Deployment Pack, it is assumed that you have knowledge of:

- Installing Linux either from CD or by means of a network
- Basic Linux command line interface operations (for example, mounting and unmounting floppy and CD-ROM drives, creating directories, and copying files)
- Network infrastructure

To perform tasks after the installation is complete, it is assumed that you have knowledge of editing files within Linux and running scripts under Linux.

Related Documents

HP recommends reviewing the following documentation before reading this guide:

- The *HP ProLiant Essentials Rapid Deployment Pack Planning Guide* provides information about how to best use the Rapid Deployment Pack as a server deployment solution. Review this document before beginning the software installation.
- *HP ProLiant Essentials Rapid Deployment Pack—Linux Edition Support Matrix* for your Rapid Deployment Pack version details which servers and operating systems are supported for deployment.
- The *HP ProLiant Essentials Rapid Deployment Pack—Linux Edition Installation Guide* provides detailed information for installing the Rapid Deployment Pack—Linux Edition. It describes the process for pre-deployment configuration of the Altiris Deployment Server for Linux and the provided Linux scripted-install jobs and installation files. Instructions for upgrading the Deployment Server and NFS server with new versions of software are also provided.

All of the documents can be found at <http://www.hp.com/servers/rdp>, on the product CD in .pdf format under /pim-lds/docs, and on the Deployment Server after the Rapid Deployment Pack installation under /opt/altiris/deployment/adlserver/docs.

Where to Go for Additional Help

Online Resources

- HP ProLiant Essentials Rapid Deployment Pack website at <http://www.hp.com/servers/rdp>
- HP ProLiant Essentials Rapid Deployment Pack Knowledge Base at <http://www.hp.com/servers/rdp>
- *ITRC User Forum “ProLiant Deployment, Provisioning (RDP, SmartStart)”* at <http://forums.itrc.hp.com>
- Altiris website at <http://www.altiris.com>

Telephone Numbers

For the name of your nearest HP authorized reseller:

- In the United States, call 1-800-345-1518.
- In Canada, call 1-800-263-5868.

For HP technical support:

- In the United States and Canada, call 1-800-652-6672.
- Outside the United States and Canada, refer to <http://www.hp.com>.

Introduction to the Rapid Deployment Pack—Linux Edition

Overview

This chapter presents an overview of the Web console and describes ProLiant-specific features that help you deploy and manage your servers.

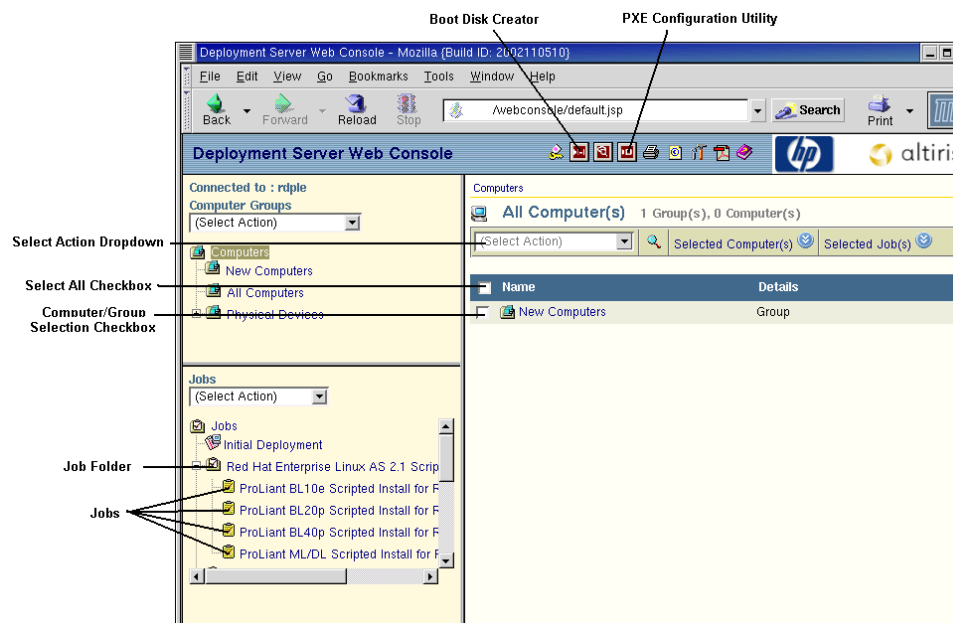
Deployment Server for Linux Web Console Overview

The Deployment Server for Linux Web Console provides the means to view and deploy servers within your network. The information in this section provides a brief description of the views and functions provided with the Web console.

Access the Web console using a Web browser at <http://hostname:8080/webconsole>, where hostname is the hostname of the Deployment Server or the static IP address of the Deployment Server in the form of xxx.xxx.xxx.xxx, for example, <http://192.168.1.1:8080/webconsole>.

Web Console View

- The **Computer Groups** pane is on the upper-left side of the Web console. **New Computers** and **All Computers** default listings are displayed here. New servers connected to the Deployment Server and ready for initial deployment will appear in the **New Computers** list.
- The **Jobs** pane is on the lower-left side of the Web console. Jobs provided as part of the ProLiant Integration Module for Linux Deployment Server installation are listed here.
- The **Details** pane is on the right side of the Web console. Details for selections highlighted within the **Computer Groups** pane or **Jobs** pane will appear here.
- The Web console toolbar is at the top of the Web console with the “Deployment Server Web Console” title. The icons here allow access to several other functions. Icon functions from left to right are: **Logout**, **Boot Disk Creator**, **ImageExplorer**, **PXE Configuration Utility**, **Print**, **About /Copyright/ Licensing Information**, **Program Options**, **Deployment Server for Linux 5.6 Product Guide** and **Help**.



Web Console Interactions

- For a new computer to appear in the console or a status icon change after an image deployment or scripted install, the Web console view should be refreshed using the Web browser Reload or Refresh function, or by highlighting a **Computer Groups** selection.
- From any Web console pane, the **(Select Action)** lists allow selection of actions to be performed on computers, computer groups, jobs, or job folders.
- From the **Details** pane, the **Selected Computer(s)** and **Selected Job(s)** links display a list of computers and jobs, respectively, that are currently chosen. For example, after selecting several servers from the **New Computers** list, clicking **Selected Computer(s)** will list the chosen servers. A selected job can then be performed on all selected servers.
- From the **Details** pane, the **Select All** checkbox located on the column title bar is used to select all computers, groups, or jobs displayed in the list below the column title bar.
- From the **Details** pane, the checkbox to the left of each computer, group, or job listed is used to select a specific computer, group, or job.
- In the **Computer Groups** or **Jobs** panes, selections can be expanded by clicking the plus sign icon before each selection name.

ProLiant-Specific Features

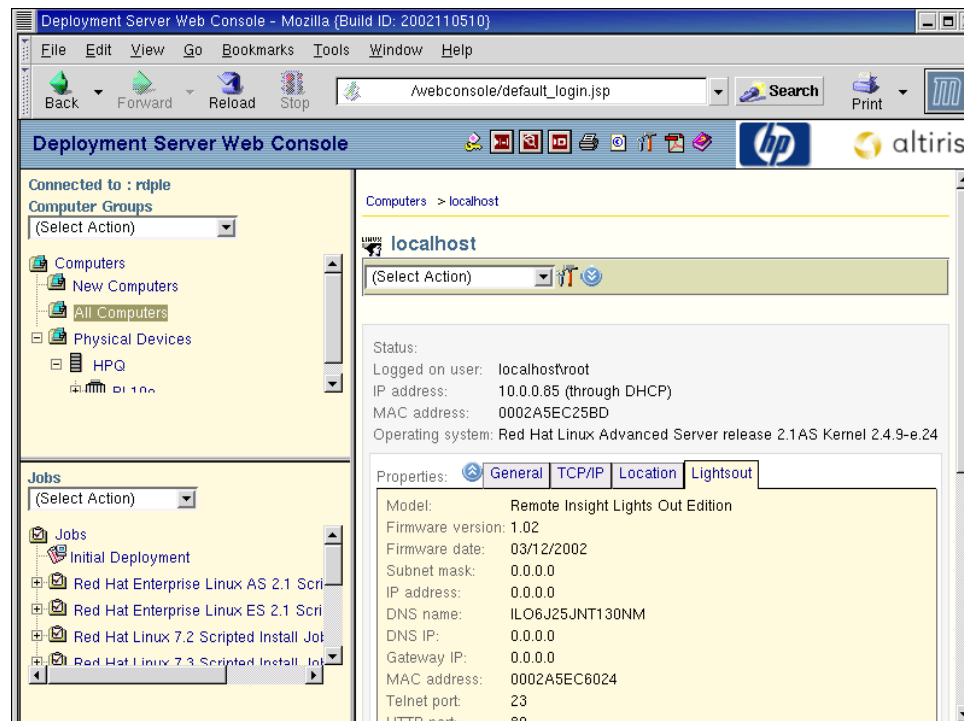
Integration with Lights-Out Management

Lights-Out Management enables the management of remote servers and the performance of remote console operations regardless of the state of the operating system or hardware.

The Deployment Server provides the ability to use the power management features of Integrated Lights-Out (iLO) and Remote Insight Lights-Out Edition (RILOE) to power on, power off, or cycle power on the target server. Each time a server connects to the Deployment Server, the deployment server polls the target server to see if iLO or RILOE is installed; if either is installed, the server gathers information including the DNS name, IP address, and first user name. Security is maintained by requiring the user to enter the correct password for that user name.

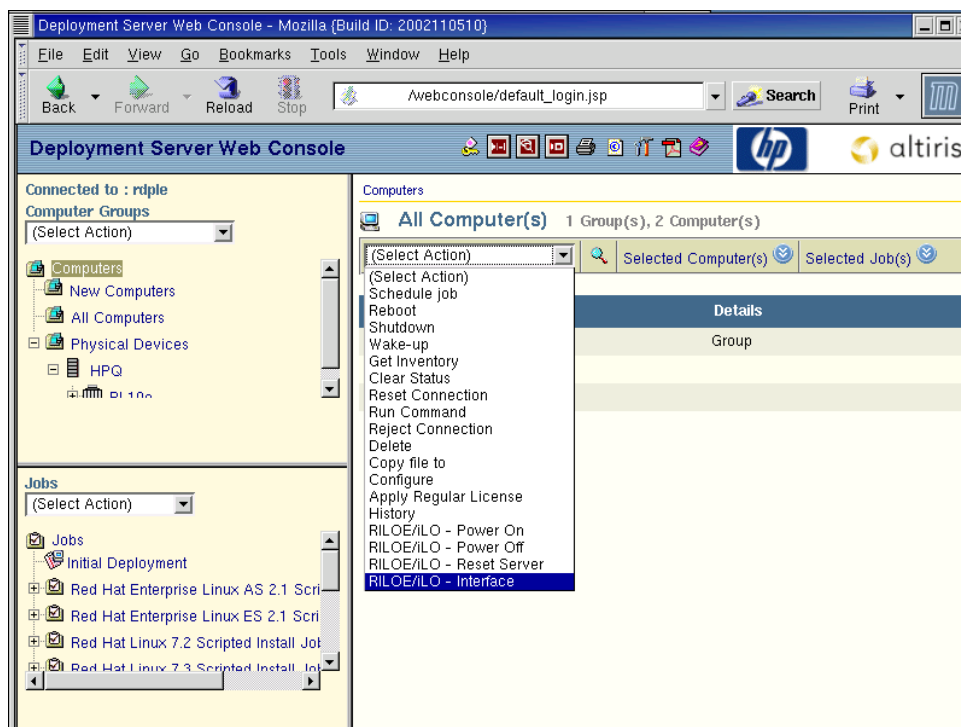
To display the lights-out stored information for each server:

1. Within the Computer Groups pane, click **New Computers** or **All Computers** to highlight your selection.
2. Within the Details pane, select the server name.
3. Click the **Properties** link.
4. Select the **Lightsout** tab.



To access the iLO or RILOE interface from the Web console:

1. Within the Computer Groups pane, select **New Computers** or **All Computers** to highlight your selection.
2. In the Details pane, select the checkbox next to the server name.
3. Within the Details pane and (Select Action) list, choose **RILOE/iLO – Interface**.








This provides easy access to such iLO and RILOE features as remote console.

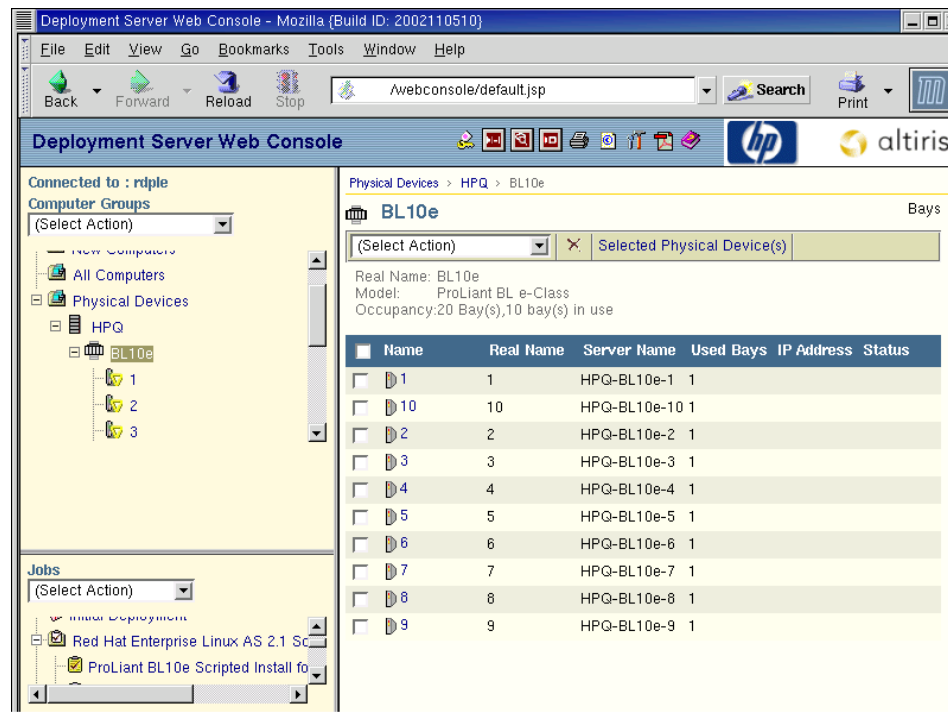
Physical Devices View

The Rapid Deployment Pack detects and displays blade servers based on their physical rack, enclosure, and bay locations. After blade servers are connected to the Deployment Server and a refresh of the Web console is performed, the Computer Groups pane will display the Physical Devices listing. The servers are viewed according to their Rack\Enclosure\Bay (R\E\B) settings. Since R\E\B is a new feature and is only available with blade servers, this view option is only presented if the Deployment Server database contains R\E\B information for any computer. A job can be deployed on a server listed in this view.

Table 1-1 lists the server icons that are used in the Physical Devices View in the Web console.

Table 1-1: Server Icons

Icon	Description
	Indicates a grouping of physical devices
	Indicates a rack
	Indicates an enclosure
	Indicates a single blade server in a bay
	Indicates that an unconfigured blade server is in a waiting state designated by the user



ProLiant BL Server Rip-and-Replace

The ProLiant BL servers include rule-based deployment based on detection of changes in physical locations. This feature enables rapid serviceability when replacing failed blade servers, a procedure called “rip-and-replace.”

The Deployment Server keeps track of the physical location of every ProLiant BL blade server and can detect when a new server has been placed in a particular bay. The Change Rules feature can be configured so that when the Deployment Server detects a new server placed into a previously occupied bay, one of several different deployment actions can occur.

NOTE: These rules are set for individual blade servers. A blade server must be discovered and deployed by the Deployment Server to access the server change rules.

IMPORTANT: Licenses applied to a specific server cannot be removed or transferred to another server.

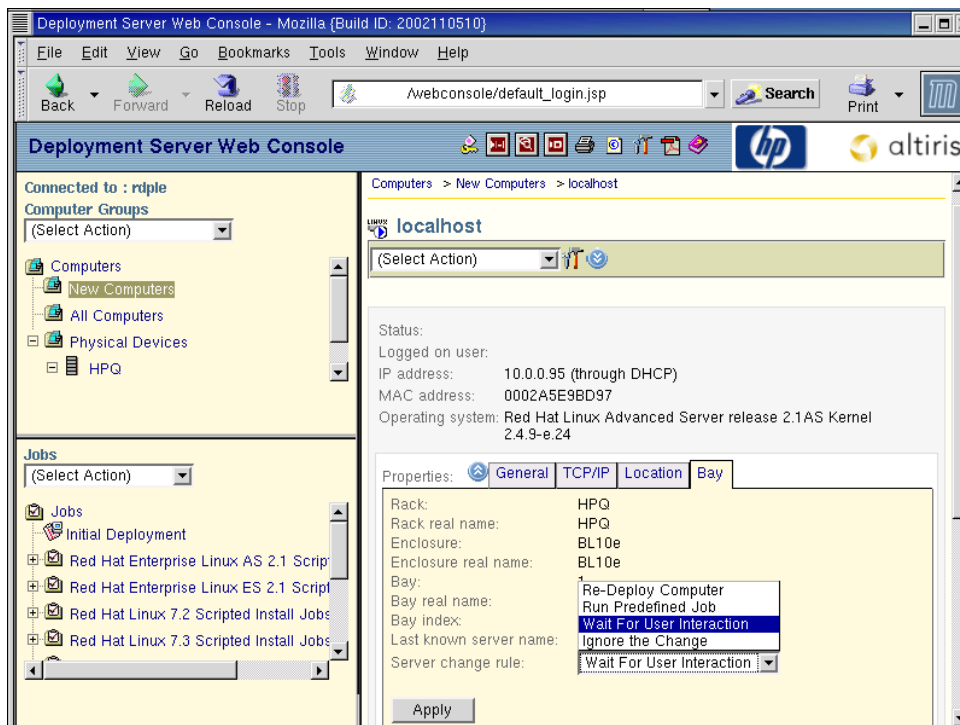
To access the server change rule:

1. Within the Computer Groups pane, click **New Computers** or **All Computers** to highlight it.
2. Within the Details pane, select the server name.
3. Click the **Properties** link.
4. Select the **Bay** properties tab.

The following rules can be configured at the **Bay** properties tab:

- **Re-Deploy Computer**—Takes the previous server configuration history and replays it on the new server. All tasks and jobs in the server history replay starting from the most recent image or scripted installation job. This is only available after the server is deployed.
- **Run Predefined Job**—Processes any job specified by the user, including the Initial Deployment job.
- **Wait for User Interaction**—Performs no job or task. The Deployment Agent on the server is instructed to wait, and the icon on the Web console is changed to reflect a waiting server.

- Ignore the Change**—Ignores the new server, meaning that no jobs are initiated. If the server existed in a previous bay, the history and parameters for the server are moved or associated with the new bay. If the server is a new one (never before seen), its properties are associated with the bay, and the normal process defined for new servers, if any, is followed.



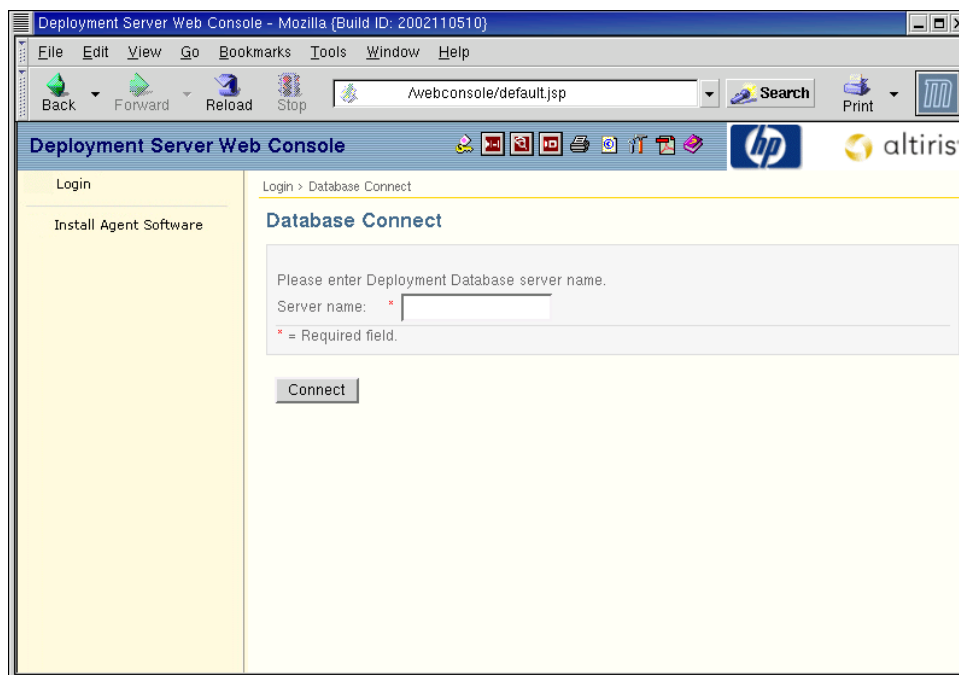
Deployment Agent for Linux

As part of the scripted installation jobs provided with the Rapid Deployment Pack, the Deployment Agent for Linux is installed. However, if you have a server already installed with Linux and want to install the Deployment Agent for Linux on that server so it can be managed by the Deployment Server, the agent installation file must be downloaded and installed on the intended server.

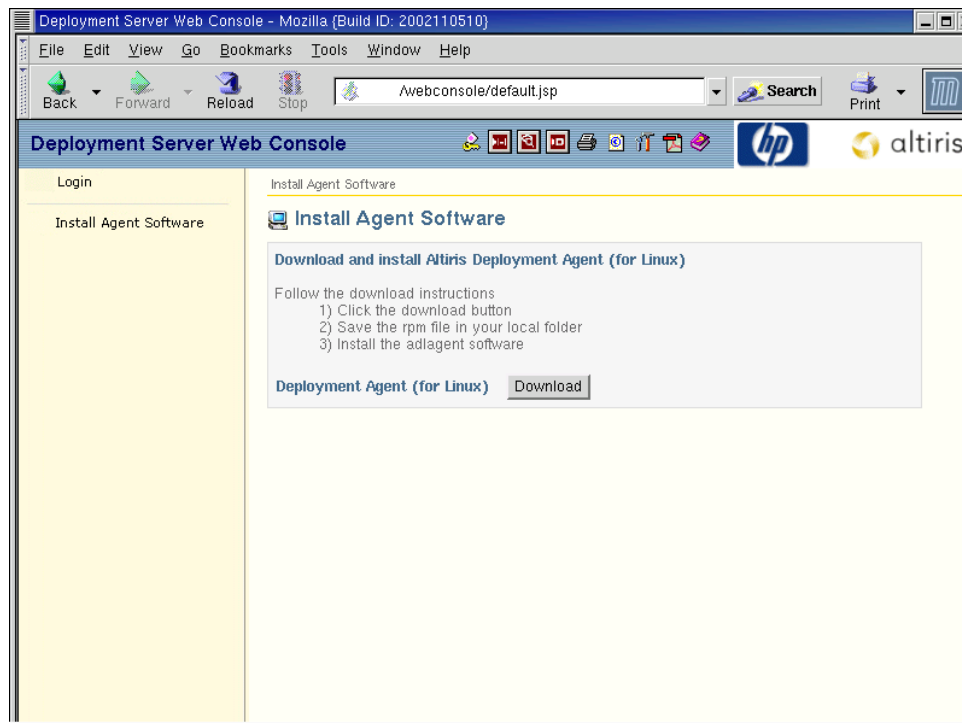
The following steps provide information to download and install the Deployment Agent for Linux by means of the Web console; however, you can also distribute the agent installation file to the intended server using various file transfer methods (such as e-mail, FTP site, and so on). When the agent installation file is transferred to the intended server, you can install the agent by following the steps for installing the Deployment Agent for Linux.” The installation file is located on the Deployment Server under `/opt/altiris/deployment/adlserver`. The installation file name is `altiris-adlagent-<version numbers>.i386.rpm`, where *<version numbers>* is the version number of the adlagent agent.

To download the Deployment Agent for Linux:

1. On the intended server, access the Web console by opening a Web browser at <http://hostname:8080/webconsole>, where hostname is the hostname of the Deployment Server or the static IP address of the Deployment Server in the form of xxx.xxx.xxx.xxx. Do not connect and log in to the console.



- Click **Install Agent Software** in the left pane of the Login page. The Install Agent Software page appears.



- Click **Download** and save the installation file (altiris-adlagent-*<version numbers>*.i386.rpm, where *<version numbers>* is the version number of adlagent) to the local directory on the server.

To install the Deployment Agent for Linux:

- On the intended server, log in as `root` or as a user with administrator rights.
- Using the command line, change directories to the location that the installation file was saved and run the installation file:

```
rpm -ivh altiris-adlagent-<version numbers>.i386.rpm
```

where *<version numbers>* is the version number of adlagent downloaded.

The Deployment Agent for Linux will be installed in the `/opt/altiris/deployment/adlagent` directory.

- When the agent is installed, change the settings in the configuration file by making direct edit changes to the `adlagent.conf` file or running a configure script from the `/opt/altiris/deployment/adlagent` directory.
- After making any edits to the configuration file, restart the Deployment Agent for Linux. This procedure must be done with administrator/root rights:

```
/etc/rc.d/init.d/adlagent restart
```

You can now view and manage the Linux server by means of the Web console.

Using the Rapid Deployment Pack

Overview

This chapter presents a usage scenario as an example to guide you through a deployment using blade servers.

Deploying ProLiant Servers

The usage scenario presented in this section employs blades as an example to:

- Deploy an operating system by means of scripted installation
- Perform an image capture
- Deploy a captured image to multiple other similar blades
- Set a deployment rule to enable rip-and-replace on a deployed blade

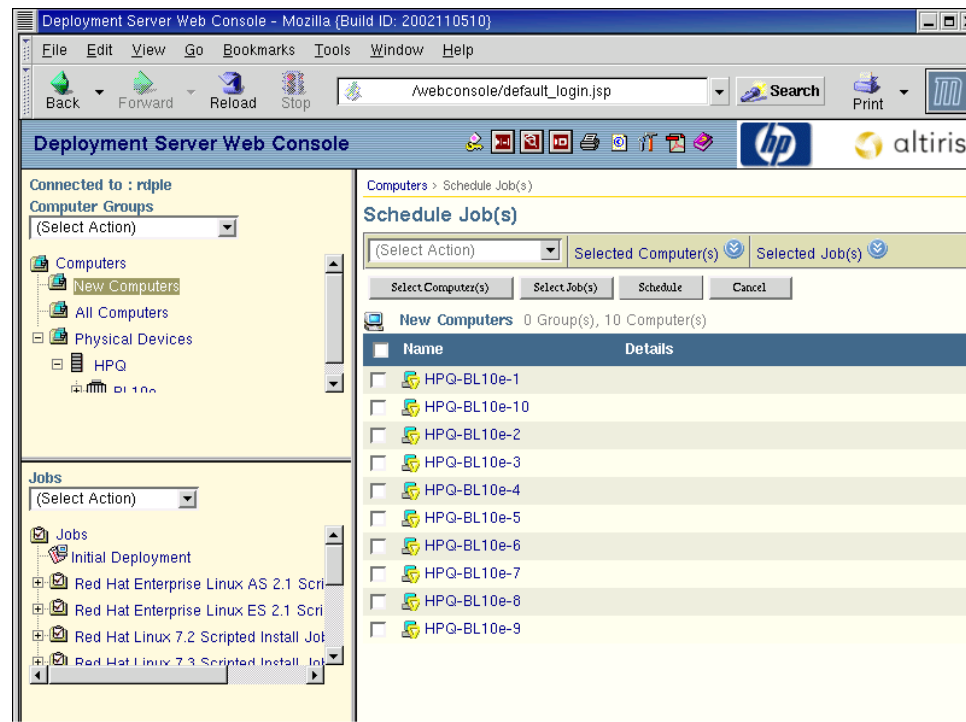
Although this scenario uses blades, the process can be duplicated for other supported HP ProLiant servers. When performing an image capture and deployment, the same hardware configuration must be used.

This scenario presumes that all necessary installation and pre-deployment steps provided in the *HP ProLiant Essentials Rapid Deployment Pack—Linux Edition Installation Guide* have been performed.

IMPORTANT: If you plan to change the default rack and enclosure names, these should be set before the first server in an enclosure connects to the Deployment Server. After the blade servers are powered up for the first time and the rack and enclosure names are recorded in Web console database, the blade servers must be rebooted for new rack and enclosure names to be discovered. For more information, refer to “Configuring ProLiant BL Server Enclosures” in the *HP ProLiant Essentials Rapid Deployment Pack—Linux Edition Installation Guide*.

Connect an enclosure of blade servers to the network and power on the enclosure. The blade servers connect to the network. The Deployment Server detects all blade servers that come online and displays them in the Computer Groups pane of the Web console under New Computers or Physical Devices by utilizing Preboot eXecution Environment (PXE).

Blade servers are indicated in the Web console by rack name-enclosure name-bay number. For example, in the following figure, the rack name of the first server is HPQ, the enclosure name is BL10e, and the bay number is 1. The blade server is denoted by an icon, which specifies that the blade server is waiting for instructions.

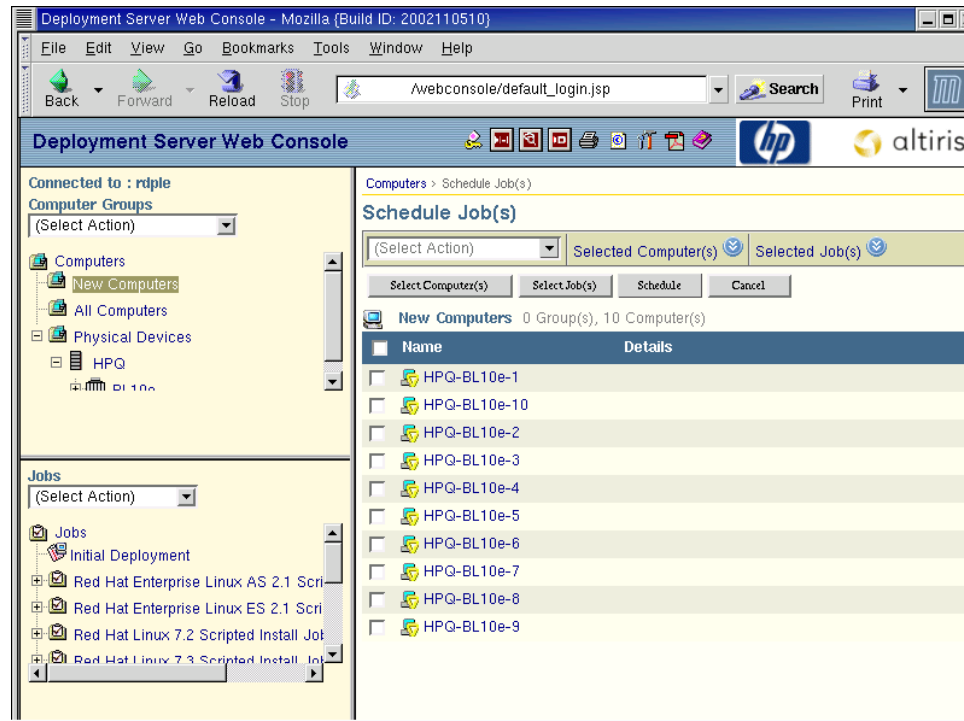


Scripted Installation Deployment for ProLiant BL Servers

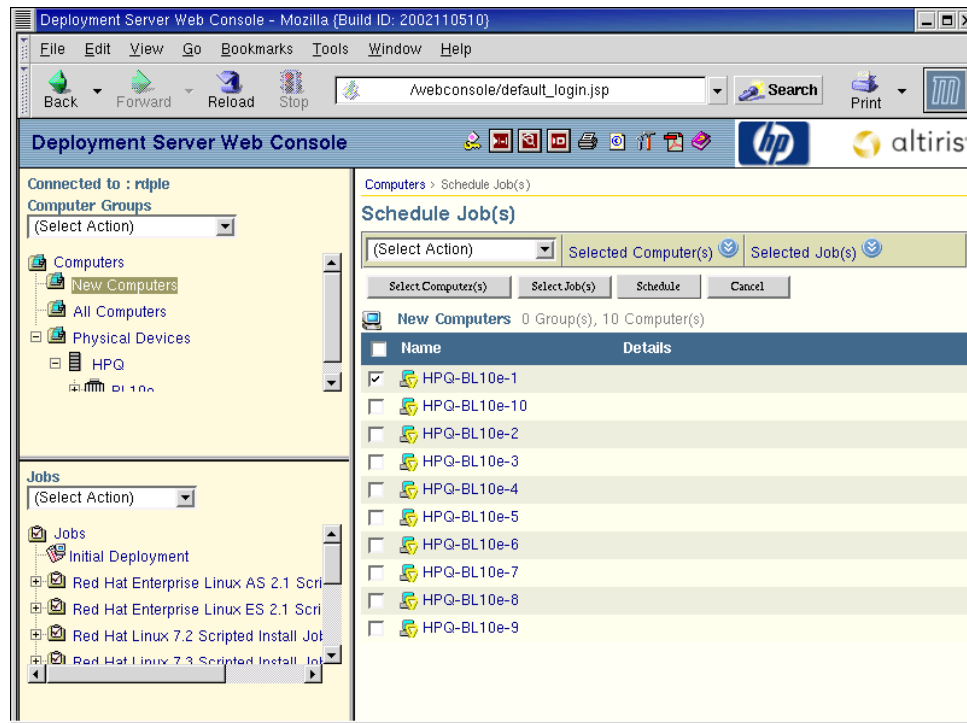
You can deploy all of the blade servers in an enclosure by means of a scripted install job. However, it is faster to run the scripted install on the first blade, which is the reference server, and then capture and deploy the reference server image to all the other blades in the enclosure simultaneously.

From the Web console, deploy a single blade server:

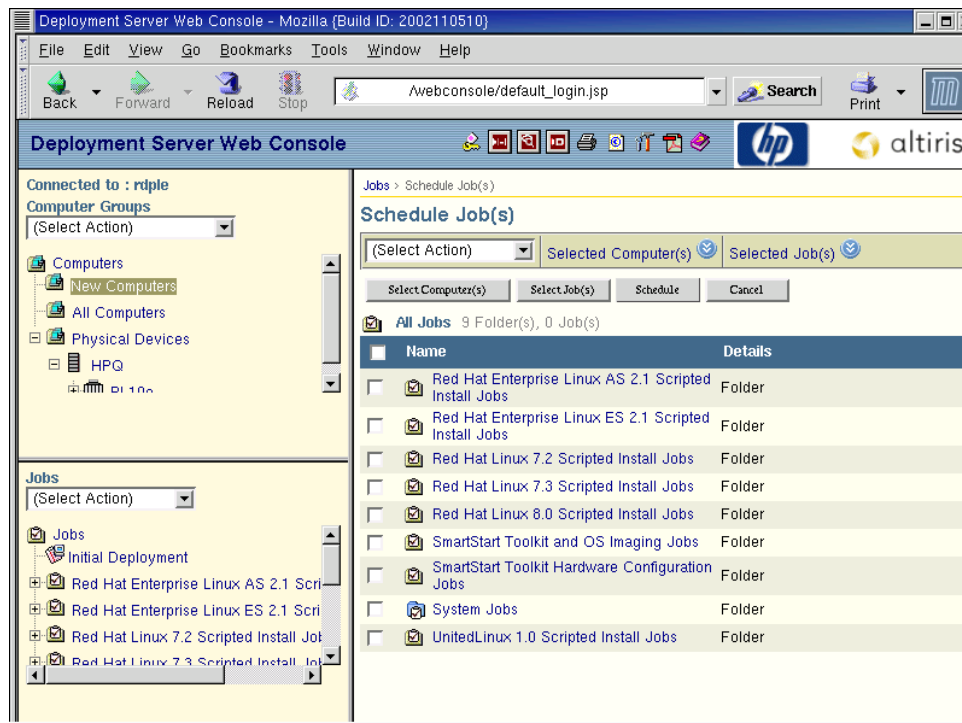
1. In the Computer Groups pane, select **New Computers**.



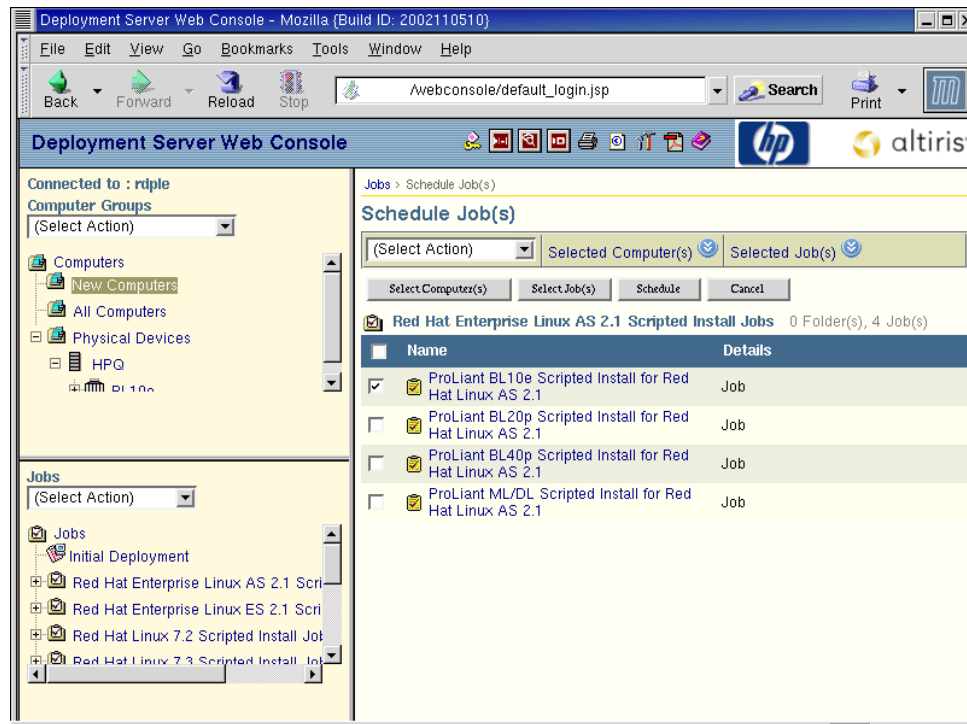
2. In the Details pane, select a single server to deploy by selecting the checkbox next to the server name.



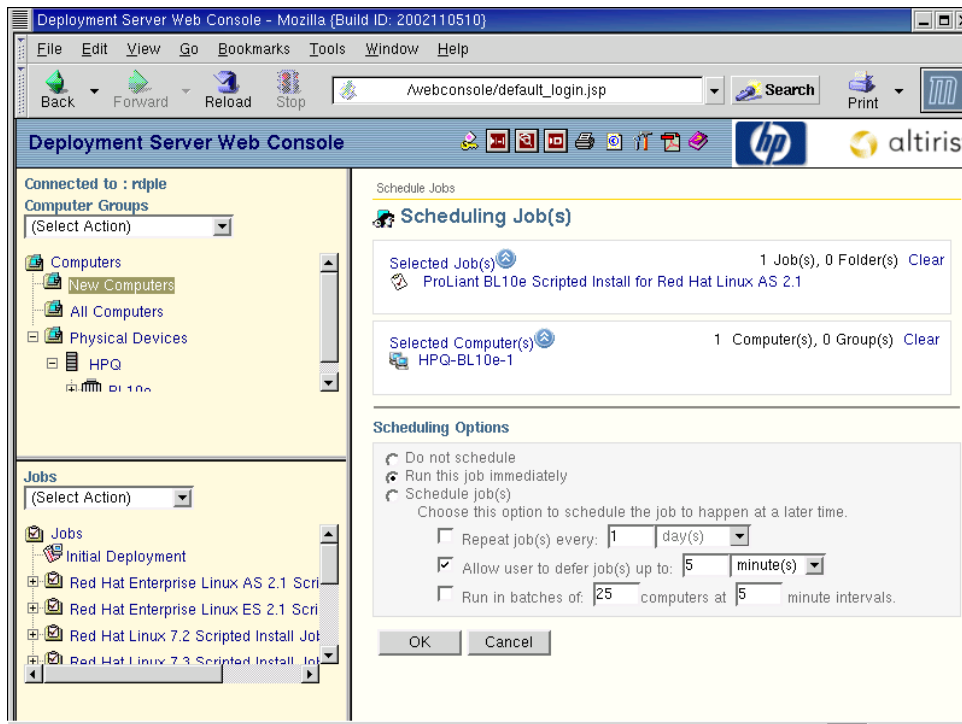
3. In the Details pane, select **Schedule Job** from the (Select Action) list. The Details pane shows a list of job and job folders that can be used on the selected server.



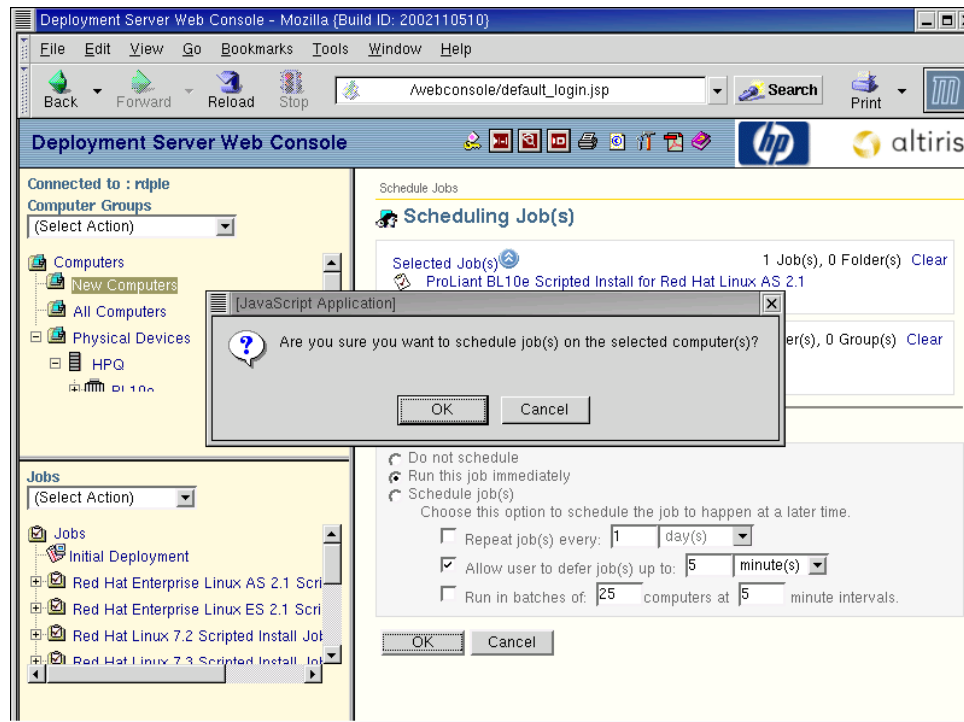
4. Click the job folder title to display jobs within that job folder in the Details pane. Select a job to deploy by selecting the checkbox next to the job name.
5. Click **Schedule**.



- Click **OK** with **Run this job immediately** selected.



7. Click **OK** to confirm the action.



At the bottom of the Details pane, the scheduled jobs are displayed.

When the server deployment is complete and the Web console is refreshed or when New Computers is selected in the Computer Groups pane, the server icon changes. The server name for the deployed server is changed to the default hostname, **localhost** for this example. After you make any necessary post-installation modifications, this server can be used as your reference server.

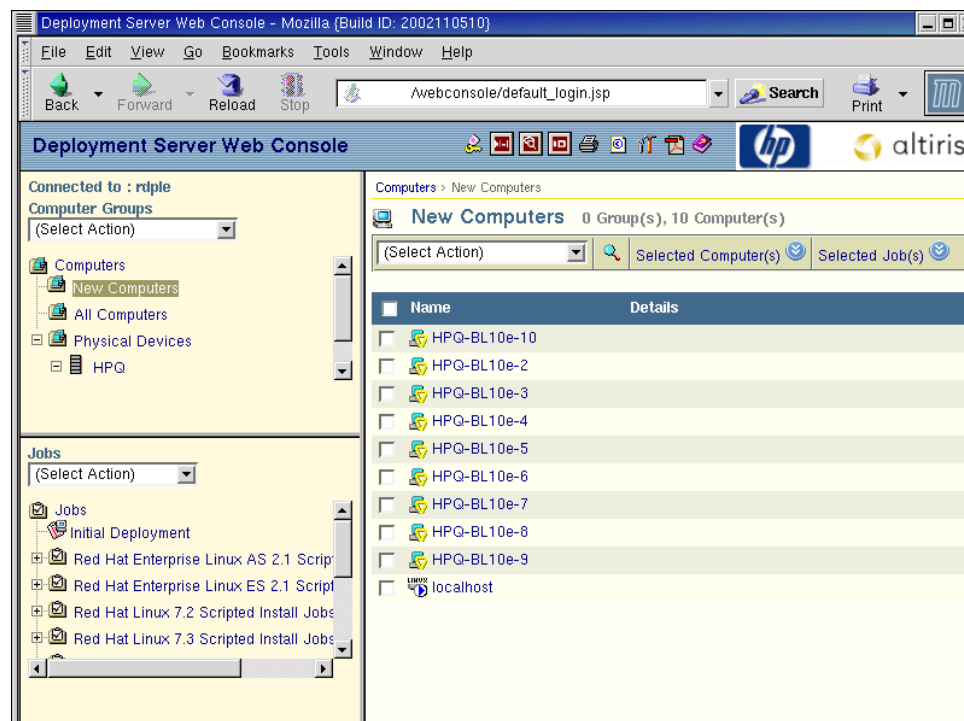
NOTE: The status of the job might change to Complete before the actual completion of the installation since the status of the installation is not communicated to the Deployment Server during the operating system portion of the scripted install job. After the installation completes, the Deployment Agent is loaded on the target server. The Deployment Agent connects to the Deployment Server automatically and displays the blue server icon. Only then can you visually confirm that the deployment is complete.

Image Capture for ProLiant BL Servers

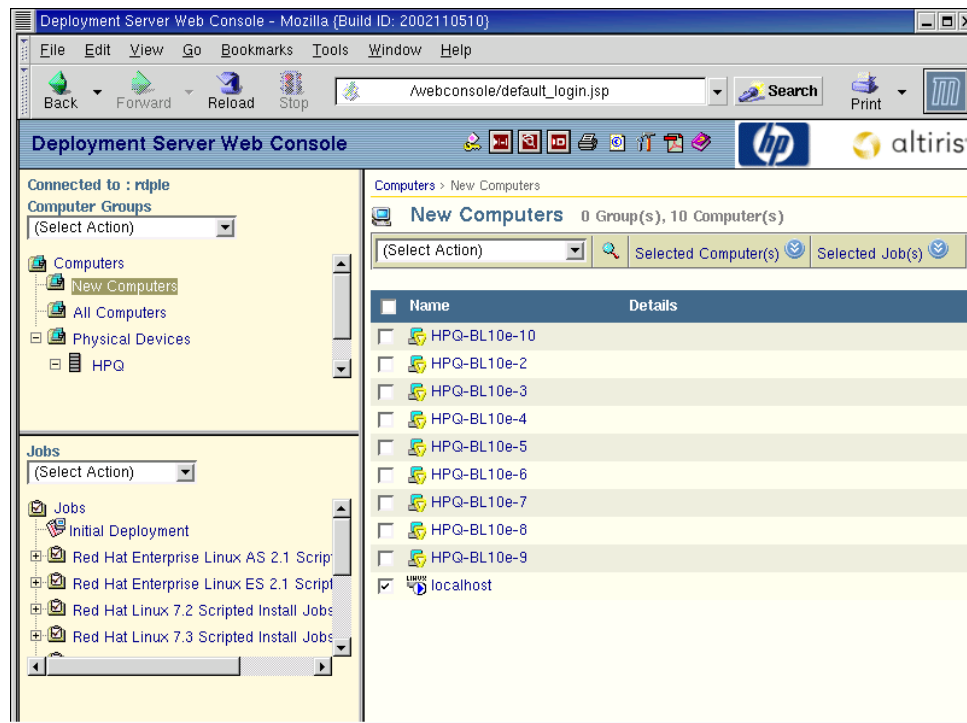
Now that a scripted install of the reference server is complete, you can perform the image capture and deploy that image to multiple similar servers.

From the Web console, capture a blade server image:

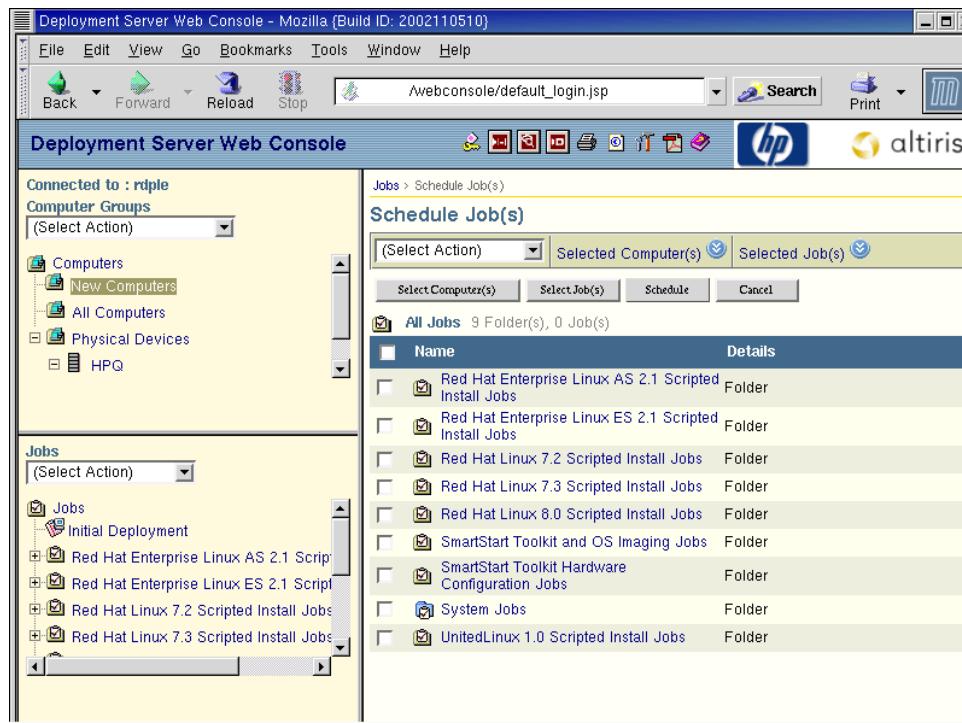
1. In the Computer Groups pane, select **New Computers**.



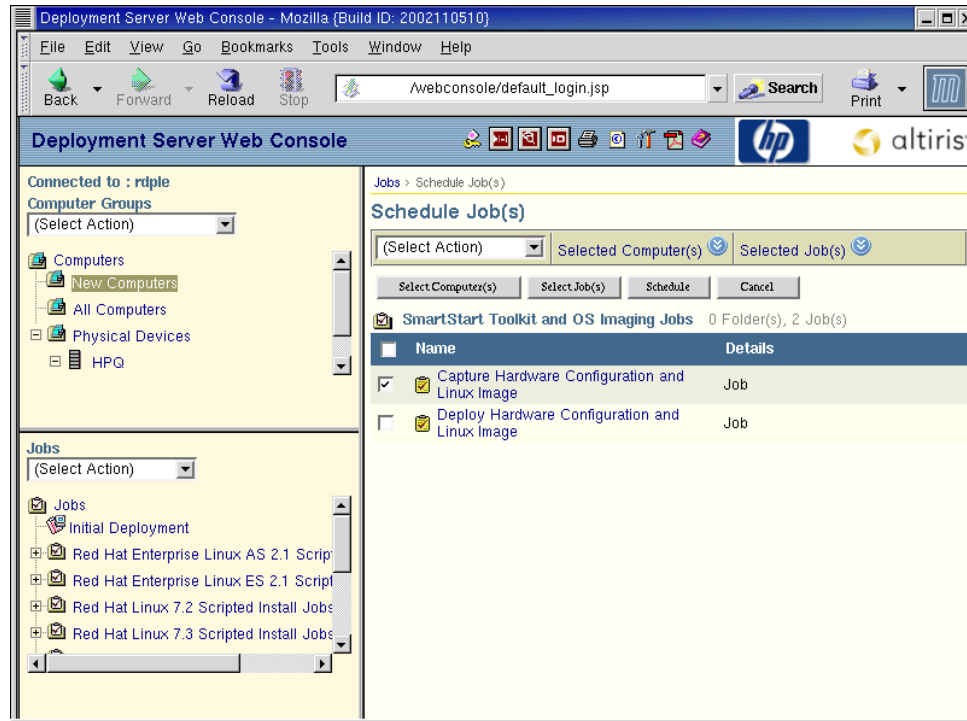
2. In the Details pane, select the reference server by selecting the checkbox next to the server name, then select **Schedule Job** from the (Select Action) list.



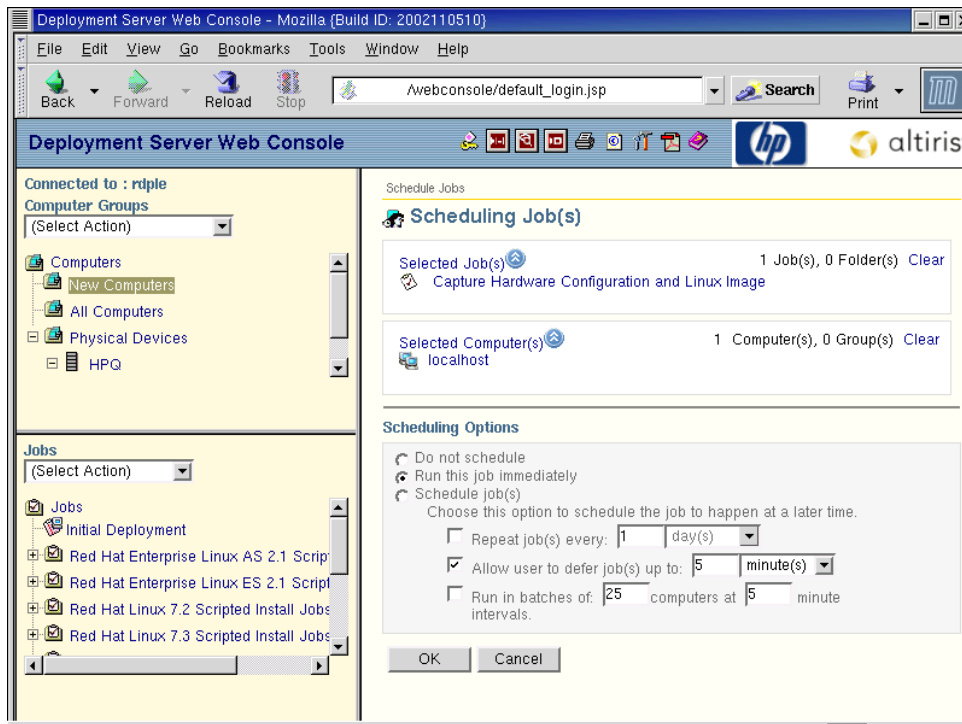
- The Details pane shows a list of job and job folders that can be used for the selected server. Select the **SmartStart Toolkit and OS Imaging Jobs** job folder name.



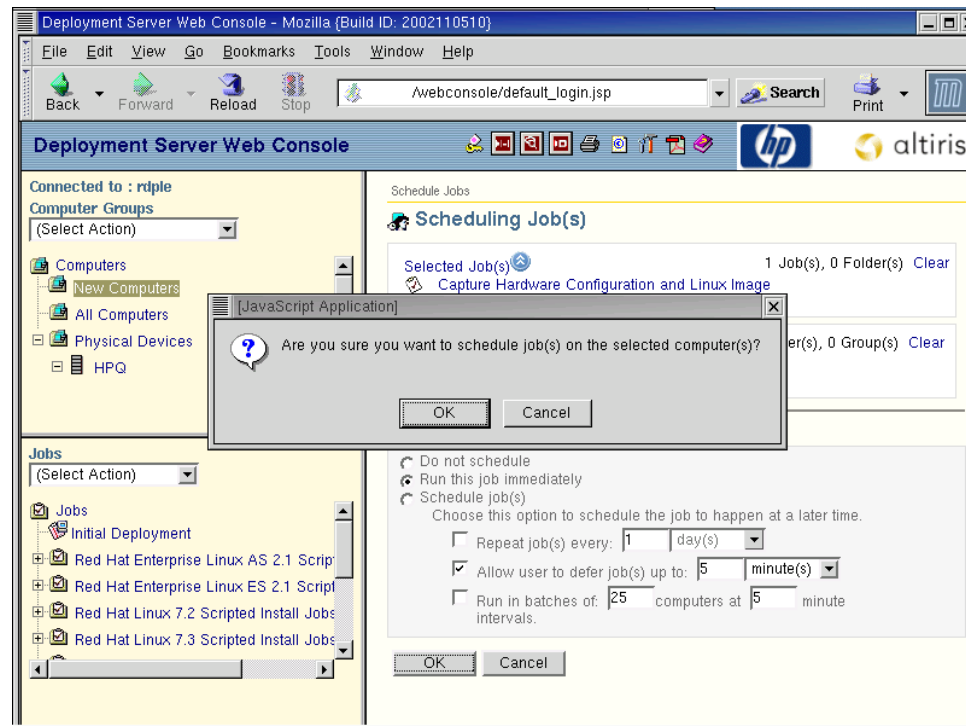
4. The Details pane shows the list of jobs within that job folder. Select the job, **Capture Hardware Configuration and Linux Image**, by selecting the checkbox next to the job name.
5. Click **Schedule**.



- Click **OK** with **Run this job immediately** selected.



7. Click **OK** to confirm the action.



IMPORTANT: The jobs provided with the Rapid Deployment Pack create and deploy images using a predefined image name. If you use the provided jobs without modification, each time you capture a new image it overwrites the previous image. To capture images for different server configurations you must copy and rename the job, then modify the file name variables within the job so that the files are saved with a unique name. For information about the provided jobs, refer to Chapter 3.

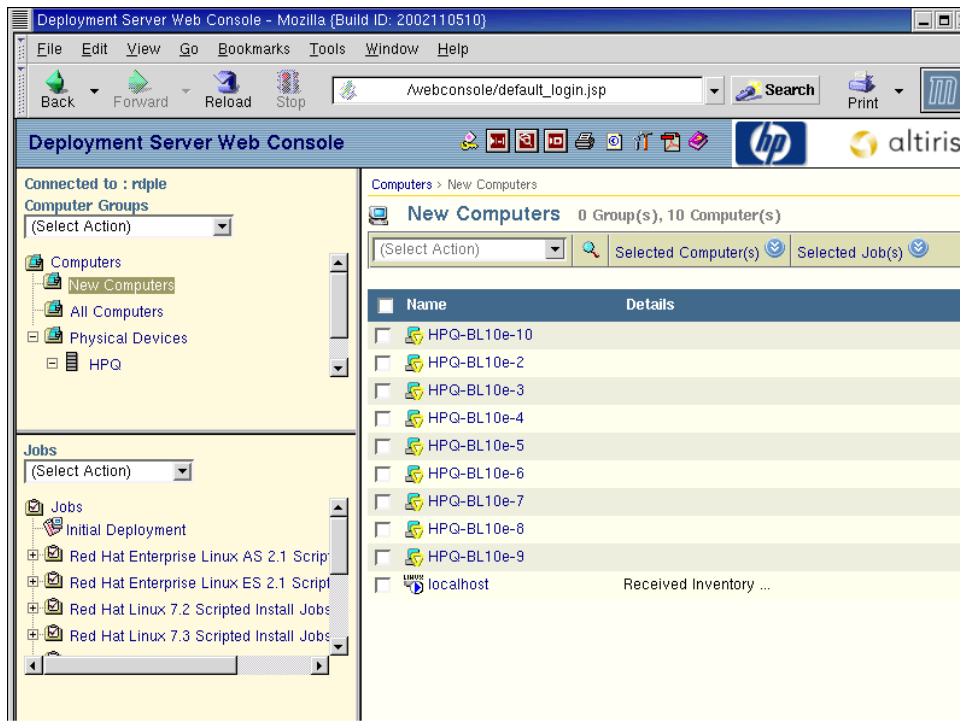
The server reboots and performs the specified tasks.

When the image capture is complete and the Web console is refreshed or when New Computers is selected in the Computer Groups pane, the server icon changes to indicate a Linux server is connected to the Deployment Server.

Image Deployment for ProLiant BL Servers

From the Web console, deploy a set of blade servers using imaging:

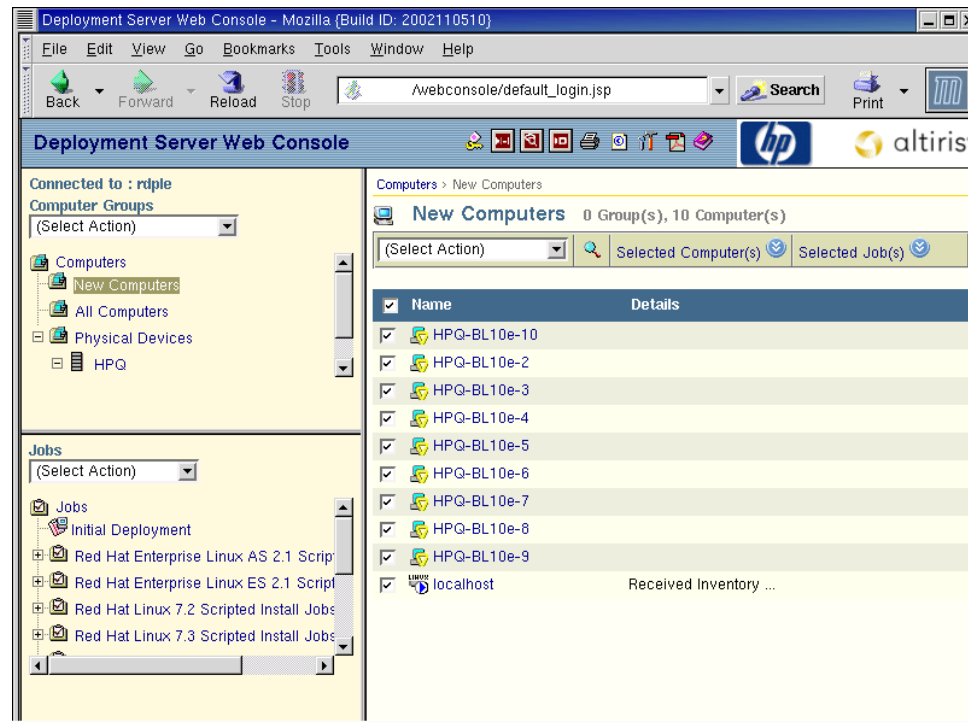
1. In the Computer Groups pane, select **New Computers**.



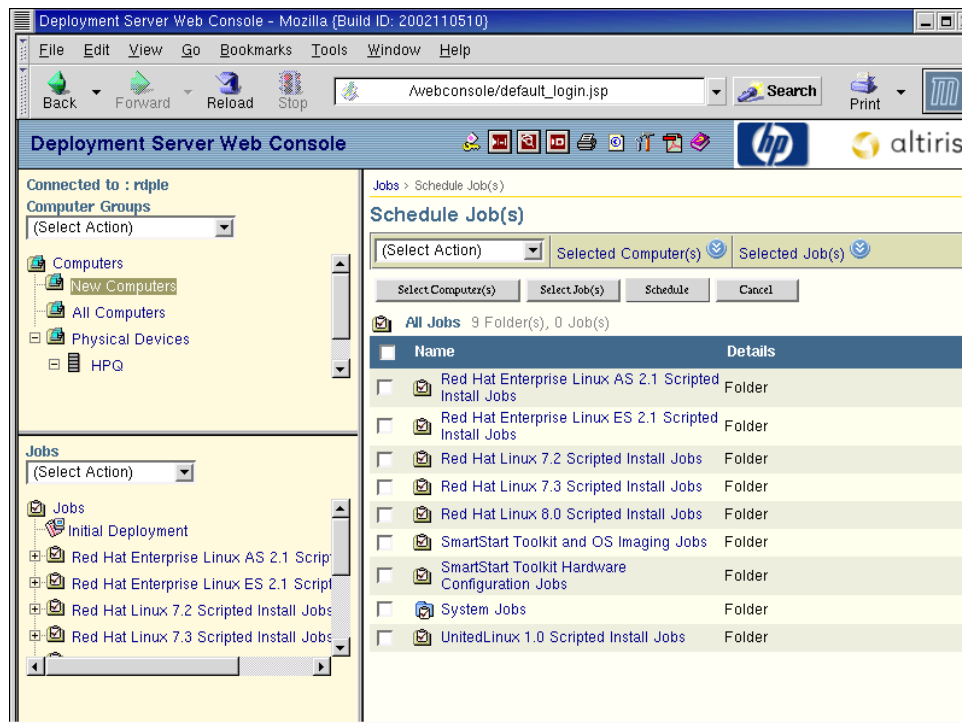
2. In the Details pane, select all the servers to deploy the image by selecting the checkbox next to the Name column heading, then select **Schedule Job** from the (Select Action) list box.

NOTE: If you are deploying the image to all the blades in an enclosure, you can select the enclosure from the Physical Devices view.

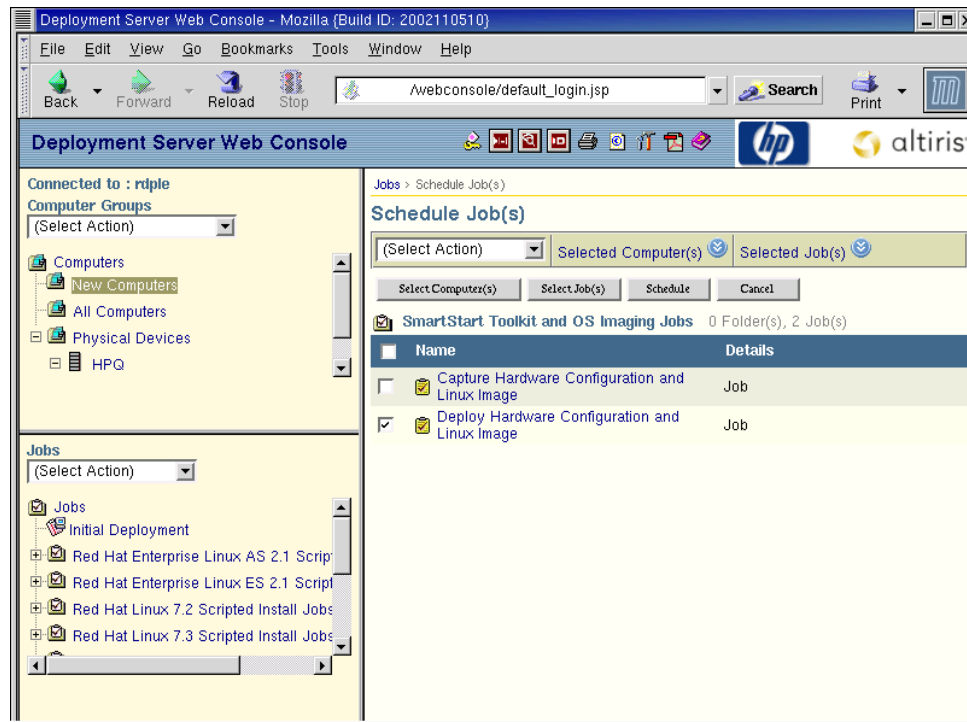
NOTE: Redeploying the captured image to the same reference server allows you to take advantage of the speed of image deployment if the reference server is ever replaced with rip-and-replace enabled.



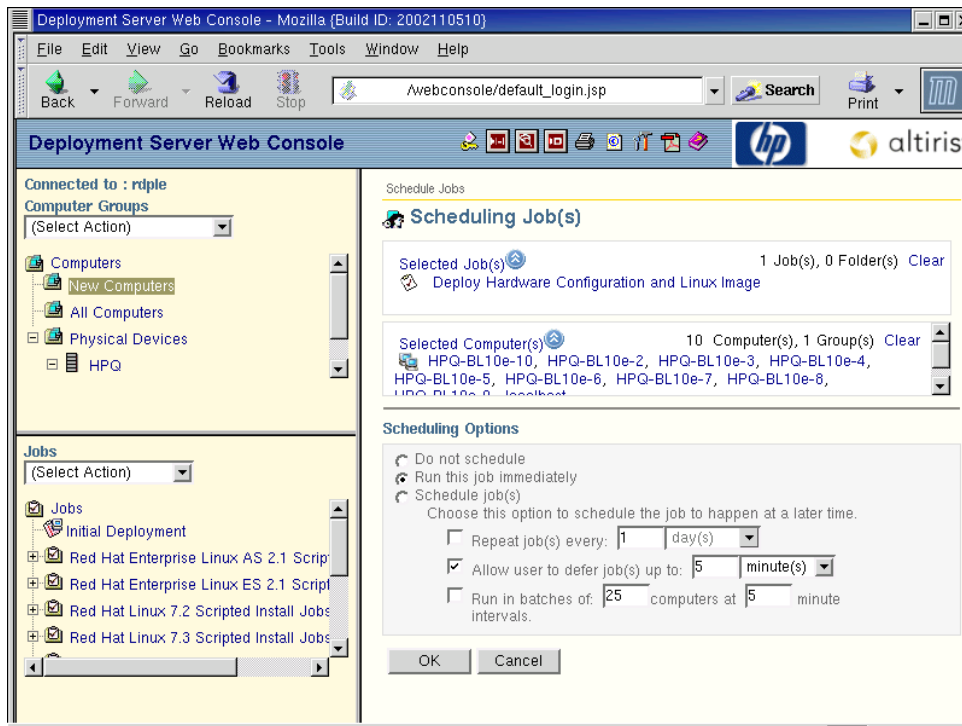
- The Details pane shows a list of job and job folders that can be used for the selected server. Select the **SmartStart Toolkit and OS Imaging Jobs** job folder.



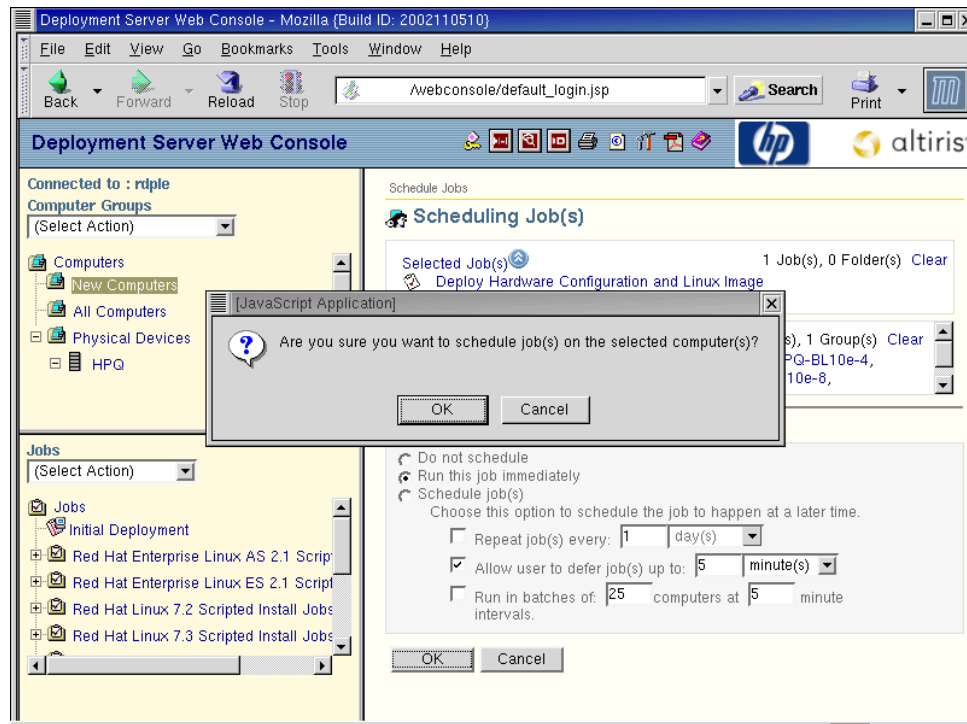
4. The Details pane shows the list of jobs within that job folder. Select the **Deploy Hardware Configuration and Linux Image** job name.
5. Click **Schedule**.



6. Click **OK** with **Run this job immediately** selected.

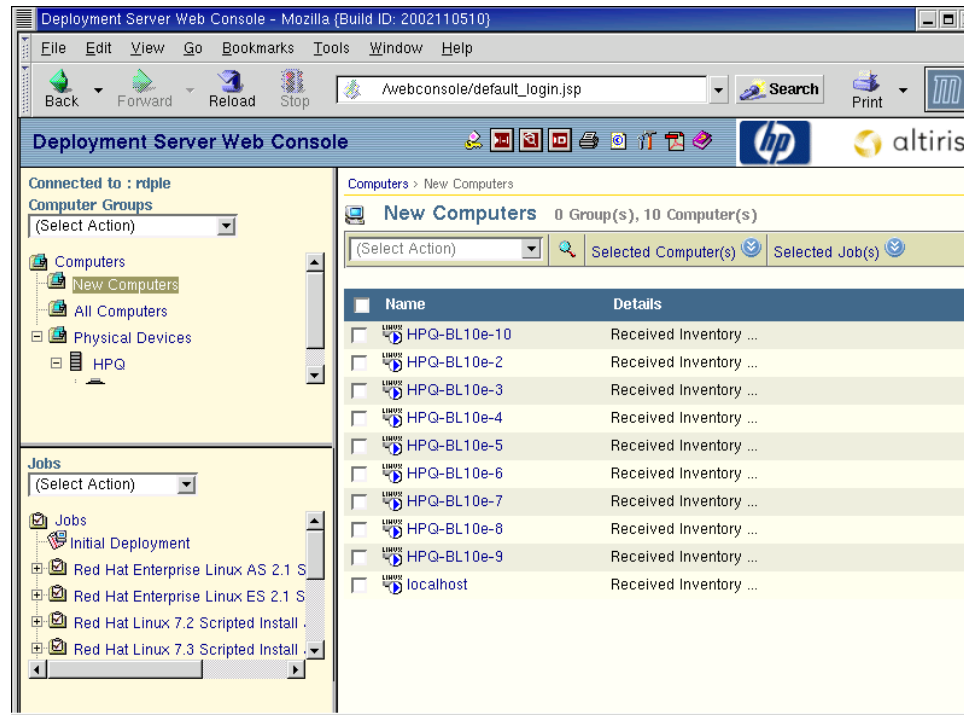


7. Click **OK** to confirm the action.



The image of the reference server previously captured is deployed to all of the selected blade servers simultaneously.

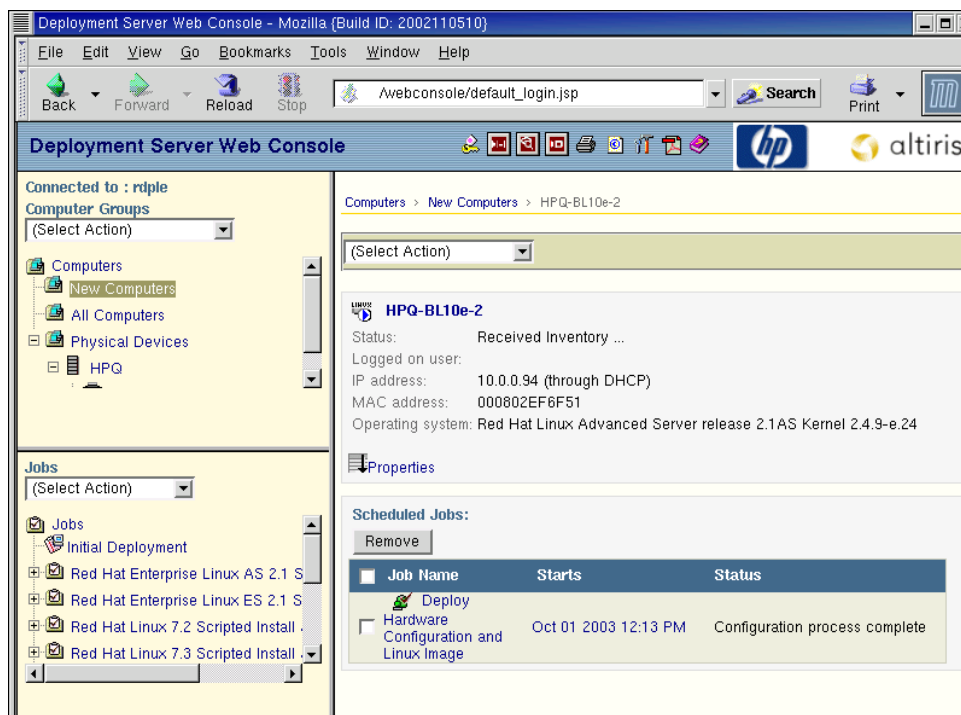
When the server deployment is complete and the Web console is refreshed or when New Computers is selected in the Web console, the server icons change to indicate a Linux server is connected to the Deployment Server.



Rip-and-Replace for ProLiant BL Servers

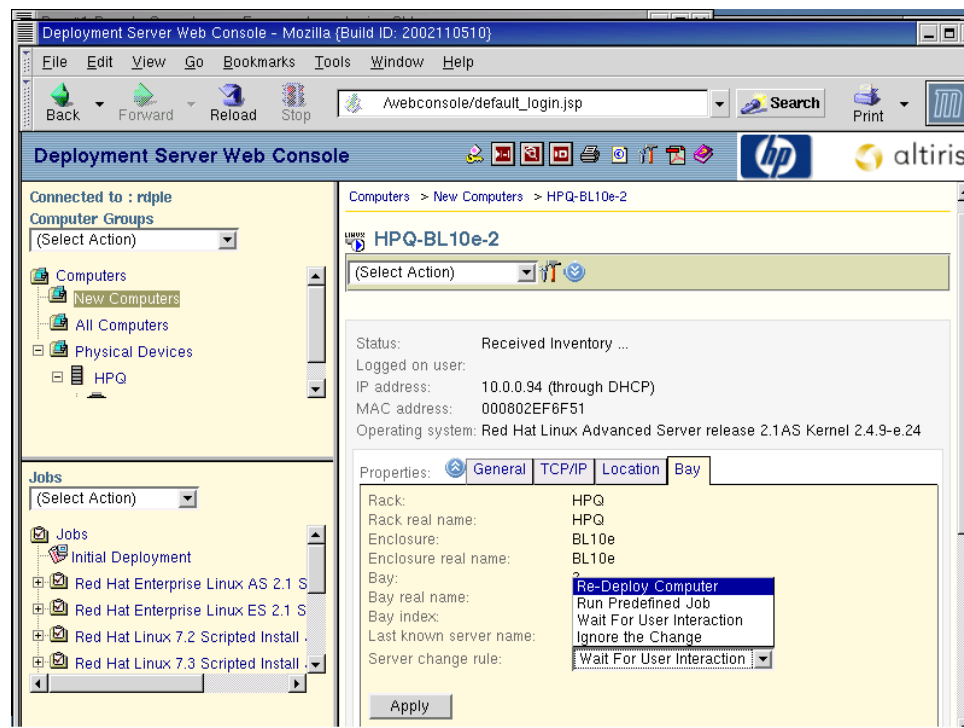
From the Web console, set a deployment rule on one of the deployed blade servers:

1. In the Computer Groups pane, select **New Computers**.
2. Select a single server. The Details pane changes to reflect the details for the selection.



3. Click the **Properties** link.
4. Select the **Bay** properties tab.

5. Select **Re-Deploy Computer** from the Server change rule list.



6. Click **Apply**.

When this blade server is replaced, the deployment history is replayed on the new server. The tasks and jobs in the server history are run starting from the most recent image or scripted installation job, which for this example would be the image deployment.

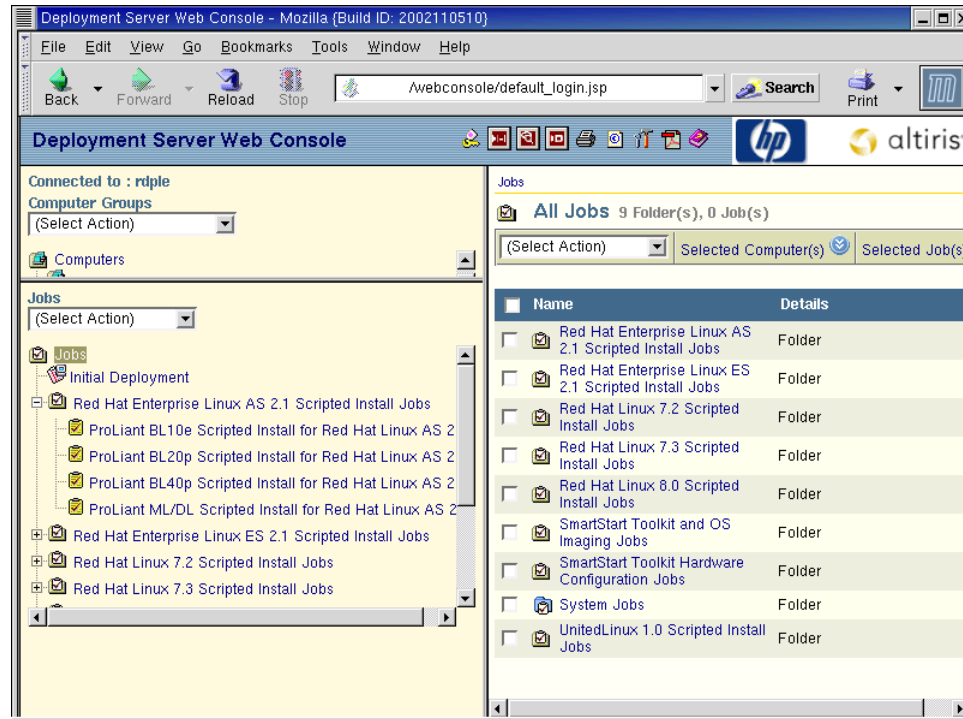
Understanding the ProLiant Integration Module for Linux Deployment Server

Overview

During the ProLiant Integration Module for Linux Deployment Server installation, jobs, tools, scripts, and configuration files for scripted and image deployment installations are provided. These jobs are the means by which the tools, scripts, and configuration files are used. This chapter explains the jobs and the location and descriptions of the provided tools, scripts, and configuration files.

Rapid Deployment Pack Jobs

Several sets of deployment jobs are imported into the Web console during installation of the Rapid Deployment Pack. They are not physical files on the Deployment Server.



These jobs are organized into the following categories:

- Scripted install jobs for specific operating systems
- SmartStart Toolkit and OS Imaging jobs
- SmartStart Toolkit Hardware Configuration jobs

Scripted Install Jobs

A scripted install job enables you to perform a scripted hardware configuration and operating system installation of Red Hat Linux or UnitedLinux on a configured or unconfigured server.

NOTE: UnitedLinux 1.0 refers to Conectiva Enterprise Linux, SCO Linux Server 4.0, SuSE Linux Enterprise Server 8, and TurboLinux Enterprise Server 8 powered by UnitedLinux 1.0.

The scripted install jobs perform the following operations consecutively:

1. Run a batch file that configures the hardware, using the CONREP and ACR utilities from the SmartStart Scripting Toolkit.
2. Reboot the computer.
3. Run a batch file that partitions the hard drive, using the CPQDISK utility.
4. Reboot the computer.
5. Run a batch file that copies support files to the hard drive of the target server and starts the operating system-specific scripted installation mechanism.

Red Hat Linux Scripted Install Jobs

Table 3-1 provides the breakdown for a ProLiant ML/DL scripted install for a Red Hat Linux job. Each bold line represents one of the tasks in the job. Under each script task is a condensed listing of the script and a description of its functionality.

Table 3-1: Contents of the Red Hat Linux Scripted Install Job

Run Script (Set Hardware Configuration)
set osfile=linux-h.ini
set hwrfile=mldl-h.ini
set aryfile=mldl-a.ini
call f:\deploy\tools\scripts\setcfg.bat This external batch file sets the hardware and array configuration settings. First, it calls CONREP with the linux-h.ini file to set the hardware operating system settings. Next, it calls CONREP with the mldl-h.ini file to set the rest of the hardware settings. Finally, it calls ACR with the mldl-a.ini file to set the array configuration settings.
Shutdown/Restart (Reboot)
Run Script (Set Disk Partition)
set prtfile=linux-p.ini
call f:\deploy\tools\scripts\setpart.bat This external batch file sets the disk partition configuration settings. It calls CPQDISK with the linux-p.ini file to set the disk partition settings.
Shutdown/Restart (Reboot)
Run Script (Install OS)
set nfsserver=0.0.0.0
set ss=ss.xxx where xxx is the ProLiant Support Pack version installed. For example, ss.640 represents version 6.40.
set os=rhyy where yy is the Red Hat Linux version. For example, rhas21 represents Red Hat Enterprise Linux AS 2.1.
set ksfile=ks.cfg
call f:\deploy\tools\scripts\rhyy.bat This external batch file prepares the target server for a Red Hat Linux scripted installation. First, it formats the hard drive. Next, it copies over Red Hat Linux boot files to the target server. Finally, it creates an autoexec.bat file. The autoexec.bat file contains a line that executes loadlin similar to the following: loadlin vmlinuz ks=nfs:%nfsserver%:/usr/cpqrdp/%ss%/%os%/%ksfile% initrd=initrd.img The <i>nfsserver</i> variable tells loadlin where to get the kickstart file. The <i>os</i> and <i>ss</i> variables are used to determine the location of the boot files to copy and determine the location of the kickstart file. The <i>ksfile</i> variable denotes the name of the kickstart file (.cfg) to use. Additional command line parameters may also be included to support specific console needs.

Upon rebooting, the target server boots to the C: drive and runs autoexec.bat, which loads the Linux setup kernel. This reboot begins the Linux NFS-based scripted installation.

Default Hardware Configuration

Hardware configuration is accomplished by means of automatic “smart default” methods provided by the SmartStart Scripting Toolkit utilities. The BIOS is configured to accept default parameters, and the array controller (if any) is configured according to one of the following methods:

- If the system contains one hard drive, the system is configured for RAID 0.
- If the system contains two hard drives, the system is configured for RAID 1.
- If the system contains three hard drives, the system is configured for RAID 5.
- If the system contains four or more hard drives, the system is configured for RAID ADG, if supported. Otherwise, the system is configured for RAID 5.

Default Red Hat Installation Settings

The provided deployment jobs specify certain default configuration parameters. To deploy servers with specific configuration settings, you must modify the scripted install job or underlying files as necessary.

Table 3-2: Red Hat Default Settings

Component	Default Settings
Linux root password	The root password for servers created using the provided scripts is password. This password is stored as clear text in the kickstart file. HP recommends that you change the root password to your own password and in encrypted form within the kickstart file. For instructions, refer to the Red Hat Linux Customization Guide located at http://www.redhat.com/docs/manuals/linux .
Drive configuration	When configuring the disk partition for a scripted operating system installation, a 75-MB boot partition is created and the remainder of the disk space is partitioned according to Linux default specifications.
Packages	Basic Linux packages are installed for a scripted operating system installation. The GNOME and KDE packages are not installed.
Firewall	Firewall settings are disabled.
ProLiant Support Pack files	HP updates and installs the latest support pack drivers and agents provided by the Rapid Deployment Pack release. The default Linux Web Agent password is password. These passwords are stored as clear text in each of the ProLiant Support Pack installation scripts.

UnitedLinux Scripted Install Jobs

Table 3-3 provides the breakdown for a ProLiant ML/DL scripted install for a UnitedLinux job. Each bold line represents one of the tasks in the job. Under each script task is a condensed listing of the script and a description of its functionality.

Table 3-3: Contents of the UnitedLinux Scripted Install Job

Run Script (Set Hardware Configuration)
set osfile=linux-h.ini
set hwrfile=mldl-h.ini
set aryfile=mldl-a.ini
call f:\deploy\tools\scripts\setcfg.bat This external batch file sets the hardware and array configuration settings. First, it calls CONREP with the linux-h.ini file to set the hardware operating system settings. Next, it calls CONREP with the mldl-h.ini file to set the rest of the hardware settings. Finally, it calls ACR with the mldl-a.ini file to set the array configuration settings.
Shutdown/Restart (Reboot)
Run Script (Set Disk Partition)
set prtfile=linux-p.ini
call f:\deploy\tools\scripts\setpart.bat This external batch file sets the disk partition configuration settings. It calls CPQDISK with the linux-p.ini file to set the disk partition settings.
Shutdown/Restart (Reboot)
Run Script (Install OS)
set nfsserver=0.0.0.0
set ss=ss.xxx where xxx is the ProLiant Support Pack version installed. For example, ss.640 represents version 6.40.
set os=ulyy where yy is the UnitedLinux version. For example, ul10 represents UnitedLinux 1.0.
set ctlfile=mldl.xml
call f:\deploy\tools\scripts\ulyy.bat This external batch file prepares the target server for a UnitedLinux 1.0 scripted installation. First, it formats the hard drive. Next, it copies over UnitedLinux 1.0 boot files. Finally, it creates an autoexec.bat file. The autoexec.bat file contains a line that executes loadlin. The <i>nfsserver</i> variable tells loadlin where to get the control (.xml) and UnitedLinux yy operating system files. The <i>os</i> and <i>ss</i> variables are used to determine the location of the boot files to copy and also are combined to determine the location of the control file. The <i>ctlfile</i> variable denotes the name of the control (.xml) file to use.
Additional command line parameters may also be included to support specific console needs.

Upon rebooting, the target server boots to the C: drive and runs autoexec.bat, which loads the Linux setup kernel. This reboot begins the Linux NFS-based scripted installation.

Default Hardware Configuration

Hardware configuration is accomplished by means of automatic “smart default” methods provided by the SmartStart Scripting Toolkit utilities. The BIOS is configured to accept default parameters, and the array controller (if any) is configured according to one of the following methods:

- If the system contains one hard drive, the system is configured for RAID 0.
- If the system contains two hard drives, the system is configured for RAID 1.
- If the system contains three hard drives, the system is configured for RAID 5.
- If the system contains four or more hard drives, the system is configured for RAID ADG, if supported. Otherwise, the system is configured for RAID 5.

Default UnitedLinux Installation Settings

The deployment jobs provided with Rapid Deployment Pack use several default configuration parameters. To deploy servers with specific configuration settings, you must modify the scripted install job or underlying files as necessary.

Table 3-4: UnitedLinux Default Settings

Component	Default Settings
Linux root password	The root password for servers created using the provided scripts is password. This password is stored in encrypted form in the control file. It is recommended that you change the root password in the control file. For instructions, refer to the AutoYaST2-Automatic Linux Installation and Configuration with YAST2 guide located at http://www.suse.de/~nashif/autoinstall/8.1 .
Drive configuration	When configuring the disk partition for a scripted operating system installation, the disk space is partitioned according to UnitedLinux default specifications.
Packages	Basic Linux packages are installed for a scripted operating system installation. The GNOME and KDE packages are not installed.
Firewall	Firewall settings are disabled.
ProLiant Support Pack files	HP updates and installs the latest support pack drivers and agents provided by the Rapid Deployment Pack release. The default Linux Web Agent password is password. These passwords are stored as clear text in each of the ProLiant Support Pack installation scripts.

SmartStart Toolkit and OS Imaging Jobs

SmartStart Toolkit and OS Imaging Jobs capture an exact copy of a server hardware configuration and hard drive image and deploy them to other ProLiant servers.

Replicating servers by means of imaging only works when the reference server and the target server are the same server model and have the same hardware configuration.

The Capture Hardware Configuration and Linux Image Job performs the following tasks:

1. Runs several commands to remove cached DHCP information from reference server.
2. Runs the Altiris imaging tool to capture the target server hard drive image.
3. Runs a batch file that captures the hardware configuration, using the CONREP and ACR utilities from the SmartStart Scripting Toolkit.

The Deploy Hardware Configuration and Linux Image Job performs the following tasks:

1. Runs a batch file that deploys the hardware configuration, using the CONREP and ACR utilities from the SmartStart Scripting Toolkit.
2. Reboots the computer.
3. Runs the Altiris imaging tool to deploy a hard drive image to the target server.

Linux systems are imaged using the default Altiris imaging mechanism. This procedure requires that the Altiris Deployment Agent for Linux is running on the system to be imaged. The imaging task instructs the Deployment Agent to perform preimaging configuration tasks on the system to be imaged, then the system reboots in DOS mode so the imaging can be performed. When the imaging is complete, the system reboots in Linux mode, where the Deployment Agent recreates the previous configuration of that system. The preimaging configuration is necessary so that when deploying a Linux image to a target system, the Deployment Agent can perform post-image configuration tasks.

SmartStart Toolkit Hardware Configuration Jobs

The SmartStart Toolkit Hardware Configuration Jobs can quickly deploy a server hardware configuration to other ProLiant servers.

The SmartStart Toolkit Hardware Configuration Jobs can run a batch file that captures or deploys the hardware configuration using the CONREP and ACR utilities from the SmartStart Scripting Toolkit. Reboot the computer (a reboot is required after configuring the array controller).

Replicating servers by means of imaging only works when the reference server and the target server are the same server model and have the same hardware configuration.

The SmartStart Toolkit Hardware Configuration Jobs also include the System Erase utility. This utility can be used to erase all the data on a system, including the hardware configuration and hard drives.



CAUTION: Using the System Erase utility will erase all data on the system. You must ensure that all appropriate backups have been made before using the System Erase utility to prevent any data loss.

Understanding the Linux Deployment Server Directory Structure

When you install the ProLiant Integration Module for Linux Deployment Server, the directory `/opt/altiris/deployment/adlserver` is populated with the tools, scripts, and configuration files.

Table 3-5 provides an overview of the directory structure for `/opt/altiris/deployment/adlserver`.

Table 3-5: Directory structure for `/opt/altiris/deployment/adlserver`

Reference Name	Directory Path	Directory Description
Images	<code>./images</code>	Contains the default image files created during an image capture task or deployed during an image deployment task.
Configurations	<code>./deploy/configs</code>	Contains hardware, array, and partitioning configuration files.
Tools	<code>./deploy/tools</code>	Contains various applications used specifically for Rapid Deployment Pack not provided by the SmartStart Scripting Toolkit.
Scripts	<code>./deploy/tools/scripts</code>	Contains operating system-specific batch files.
SmartStart Scripting Toolkit	<code>./deploy/tools/ssst</code>	Contains the SmartStart Scripting Toolkit, which includes the SmartStart Scripting Toolkit documentation.
Linux Boot Files	<code>./deploy/cds/compaq/ss.xxx/yyyy</code>	Contains Linux-specific installation kernels and initial RAM disk images for starting the operating system-specific scripted installation. xxx represents the ProLiant Support Pack version installed and yyyy represents the Linux distribution shortcut name.
Documentation	<code>./docs</code>	Contains documentation for Rapid Deployment Pack –Linux Edition.

Images

When performing the Capture Hardware Configuration and Linux Image, and Deploy Hardware Configuration and Linux Image jobs, the Linux Image files are saved in this directory. These provided jobs use the default image file, `lnxcap.img`, which is specified within the imaging tasks of the jobs. If you use the jobs without modification, each time you capture a new image it will overwrite the previous image. To capture or deploy images for different server configurations, you must copy and rename the jobs, then modify the image file name in the imaging task so that the files are saved with a unique name.

Configurations

The various initialization files for setting the server hardware, array, and drive partitions during the scripted installation jobs are found in this directory.

When performing the Capture Hardware Configuration and Linux Image and Deploy Hardware Configuration and Linux Image jobs, the default initialization files representing hardware configuration and array configuration are `lnxcap-h.ini` and `lnxcap-a.ini`, respectively. When these files are stored in the `./configs` directory, the file names are converted to all capital letters.

When performing the Capture Hardware Configuration and Deploy Hardware Configuration jobs, the default initialization files representing hardware configuration and array configuration are `cpqcap-h.ini` and `cpqcap-a.ini`, respectively. When these files are stored into the `./configs` directory, the file names are converted to all capital letters.

If you use the capture jobs without modification, each time you capture a new configuration, it will overwrite the previous configuration. To capture and deploy configurations for different servers, you must copy and rename the jobs, then modify the configuration file name variable within the jobs so that the files are saved with a unique name.

Table 3-6: Configuration Files

Files	Used for
*-h.ini	CONREP.EXE
*-a.ini	ACR.EXE
*-p.ini	CPQDISK.EXE

Tools

This directory contains tools used during server deployment that are not included in the SmartStart Scripting Toolkit.

Scripts

The scripts contained in this directory are used for:

- Wrapping utilities in the SmartStart Scripting Toolkit to detect and report errors back to the operating system
- Setting up the target server to begin an operating system installation

Table 3-7: Script Files

Files	Used for
acr.bat	Calls ACR.EXE
conrep.bat	Calls CONREP.EXE
cpqdisk.bat	Calls CPQDISK.EXE
set*.bat	Sets operating system, hardware, array, and partition settings
get*.bat	Gets operating system, hardware, array, and partition settings
yyyy.bat	Prepares hardware for Linux install, where yyyy is the Linux distribution shortcut name

Linux Boot Files

One directory per operating system is created to store the Linux boot files in the `./deploy/cds/compaq/ss.xxx` directory. The directory names are derived from the operating system name to distinguish each Linux operating system version. For example, `./deploy/cds/compaq/ss.640/rhas21` is the directory name for the ProLiant Support Pack version 6.40 and Red Hat Enterprise Linux AS 2.1.

The files located within each of these directories are used by the scripted installation jobs to start the Linux installation. The following files are used:

- `initrd.img`—the initial ram disk Linux image
- `vmlinuz`—Linux boot kernel
- `loadlin.exe`—executable to load the Linux image and run the kernel

Documentation Files

The Rapid Deployment Pack documentation is installed in the `./docs` directory in Portable Document Format (.pdf). The X Window System package for viewing .pdf files can be used to view these files on a Linux server. These files can also be viewed from a Windows computer using Adobe Acrobat Reader.

Understanding the ProLiant Integration Module for NFS Server

Overview

The ProLiant Integration Module for NFS Server provides the source for the Linux distribution files, Linux installation files (either Kickstart for Red Hat installations or control files for UnitedLinux installations), and ProLiant Support Pack files. This chapter explains the default file and directory structure provided. The default installation settings located within these files are discussed in Chapter 3.

Understanding the NFS Directory Structure

Installing the ProLiant Integration Module for NFS populates the /usr/cpqrdp directory with the operating system distribution files, Linux installation files, and ProLiant Support Pack files according to the choices made during installation. Table 4-1 provides an overview of the directory structure within /usr/cpqrdp.

Table 4-1: NFS Directory Structure

Reference Name	Directory Path	Directory Description
Linux distribution files	/usr/cpqrdp/yyyy	Contains the operating system source files from the Linux OS distribution CDs. The Linux distribution shortcut name is represented by yyyy.
Linux installation files	/usr/cpqrdp/ss.xxx/yyyy	Contains the Linux installation files. The ProLiant Support Pack version is represented by xxx and yyyy is the Linux distribution shortcut name.

Linux Distribution Files

Within the /usr/cpqrdrp directory, one directory is created per operating system for storing the Linux distribution source files. The directory names are derived from the operating system name to distinguish each Linux operating system version. For example, /usr/cpqrdrp/rhas21 is the directory name for the Red Hat Enterprise Linux AS 2.1 files.

NOTE: Red Hat distribution CD-ROM .iso images can be used in place of the source files at this location. This capability is not provided for Red Hat 7.2. For more information, refer to *HP ProLiant Essential Rapid Deployment Pack Knowledge Base*.

Linux Installation Files

In addition to the operating system directory path created in the /usr/cpqrdrp directory, a path associated with the support version, ss.xxx, is also created, where xxx represents the support pack version.

Red Hat

For each Red Hat Linux distribution, the kickstart installation files are stored in the /usr/cpqrdrp/ss.xxx/rhyy directory, where rhyy represents the Red Hat distribution shortcut name. For example, Red Hat Enterprise Linux AS 2.1 installation files would be saved in the /usr/cpqrdrp/ss.xxx/rhas21 directory. Different kickstart files are provided based on server model because of differences in technology, installation requirements, or both.

The support pack files associated with each specific distribution are located one directory down from the Linux installation files in the /usr/cpqrdrp/ss.xxx/rhyy/csp directory. A script file, labeled rhyy.sh, is provided that will install the ProLiant Support Pack components during a Linux scripted installation.

UnitedLinux

For the UnitedLinux distribution, the control installation files are stored in the `/usr/cpqrdp/ss.xxx/ulyy/control` directory where *ulyy* represents the UnitedLinux distribution shortcut name. For example, UnitedLinux 1.0 installation files would be saved in the `/usr/cpqrdp/ss.xxx/ul10/control` directory. Different control files are provided based on server model because of differences in technology, installation requirements, or both. The directory containing UnitedLinux updates is located within the control directory at `/usr/cpqrdp/ss.xxx/ulyy/control/updates`. Support files for UnitedLinux Service Packs with Linux scripted installations are provided within the updates directory.

The UnitedLinux utility scripts that add functionality for the deployments are stored in the `/usr/cpqrdp/ss.xxx/ulyy/extras` directory. This directory includes the Service Pack installation script for incorporating the Service Pack files into the base UnitedLinux distribution.

The ProLiant Support Pack files associated with UnitedLinux are found in the `/usr/cpqrdp/ss.xxx/ulyy/csp` directory. A script file, labeled `ulyy.sh`, is provided for installing the support pack components during a Linux scripted installation.

Customizing the Provided Jobs, Scripts, Tools, and Configuration Files

Overview

This chapter includes the following topics:

- Customizing the Linux Deployment Server Web Console Jobs
- Customizing the ProLiant Integration Modules for Linux Deployment Server and NFS Server

The following sections provide information on modifying the provided jobs and files for your own needs. Before you begin customizing the provided jobs and files:

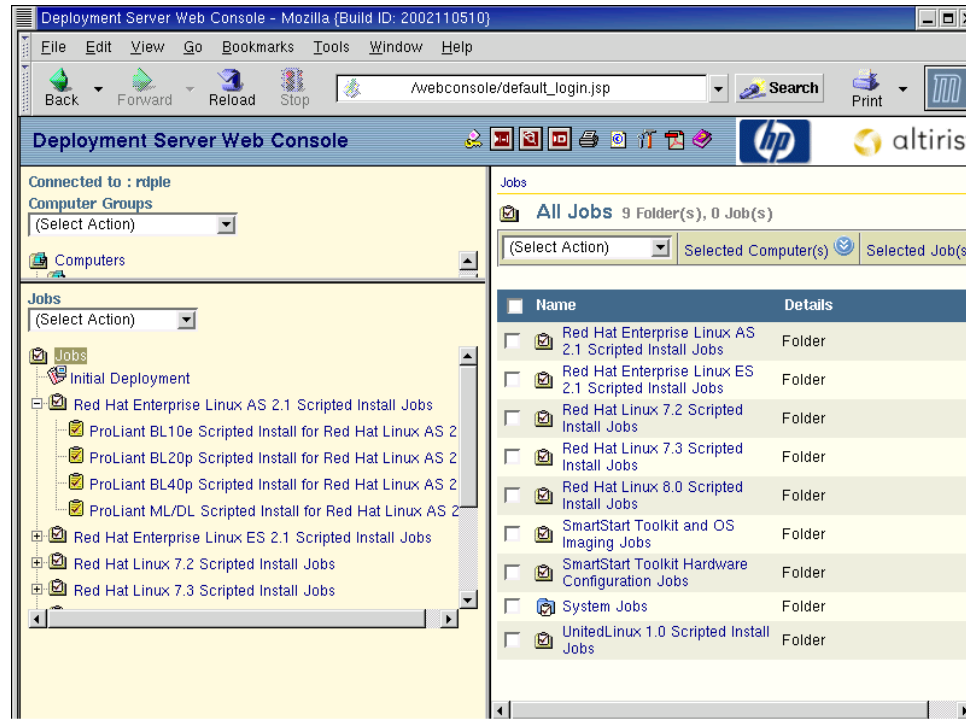
IMPORTANT: Be sure that you always have a backup copy of the provided jobs and files available.

- Familiarize yourself with the Deployment Server/NFS server directory and file structure. For additional information, refer to Chapters 3 and 4.
- Select any text editor to use for modifying Linux files on the Deployment Server, the NFS server, or both.
- Make copies of the provided jobs and files for backup to ensure that a working version exists in case you encounter a problem.

Customizing the Web Console Jobs Pane

The Web console is the user interface for managing and deploying servers. Within the Web console, all the jobs are categorized in a folder hierarchy in the **Jobs** pane. You can rearrange the folders and edit the jobs.

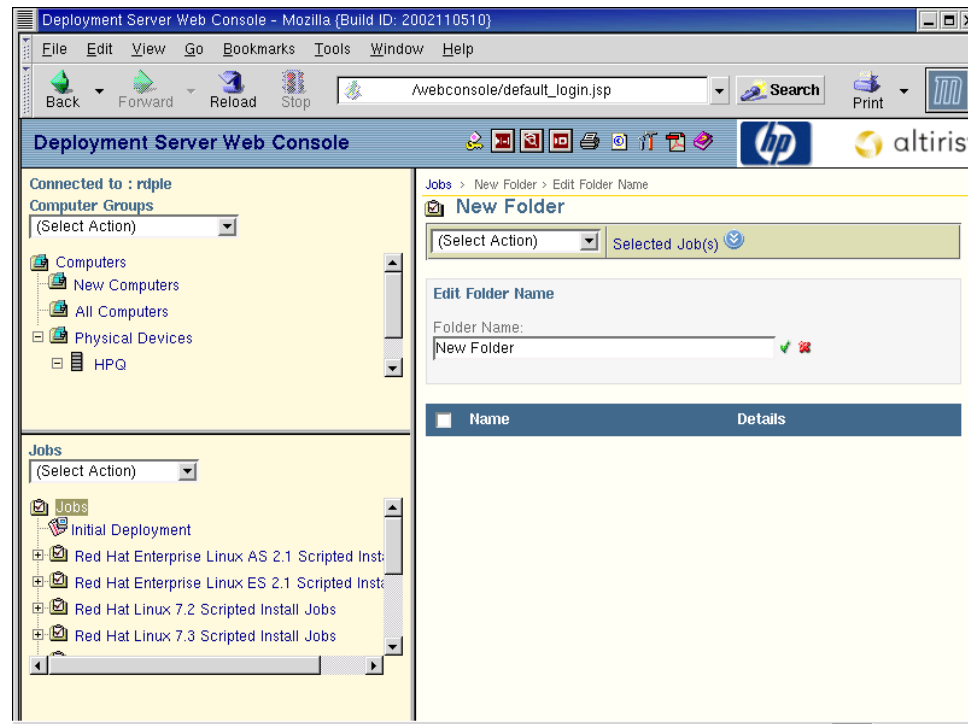
This section explains how to add, copy, and delete job folders and jobs. For additional information about the customization features of the Web console, refer to the *Altiris Deployment Solution 5.6 for Linux Product Guide*, which can be found at <http://www.hp.com/servers/rdp>.



Adding a New Job Folder

To add a new job folder:

1. In the Jobs pane, click the **Jobs** top-level folder, or click a job folder to create a new subfolder. This highlights the folder name.
2. From the (Select Action) list, select **New Job Folder**.
3. In the Details pane, enter a descriptive name in the **Folder Name** field.

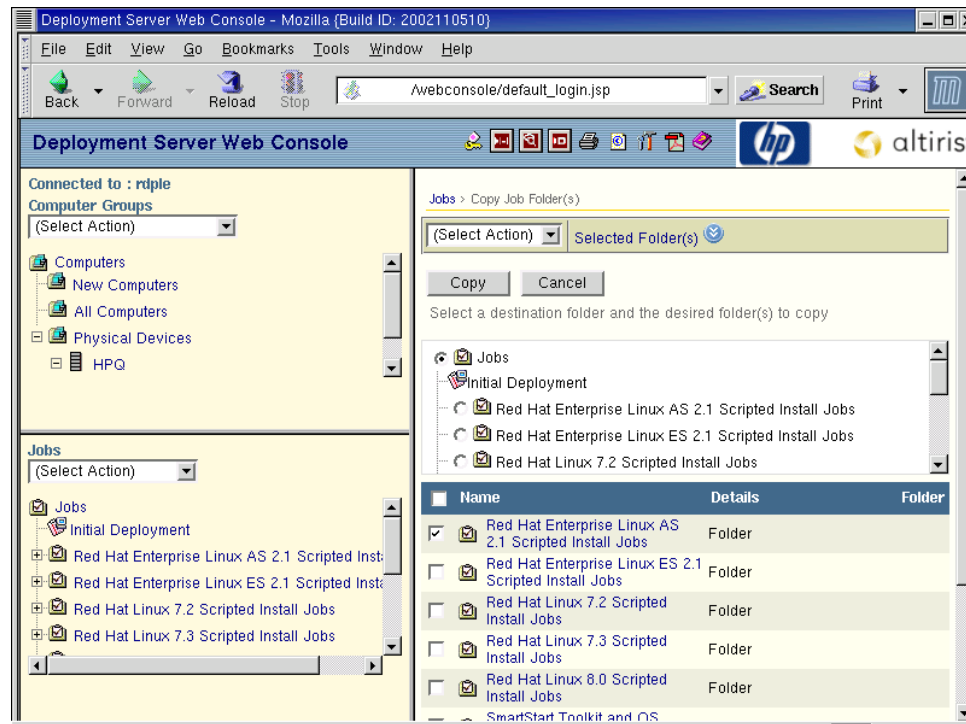


4. Click the green check mark icon at the end of the **Folder Name**.

Copying a Job Folder

To copy a job folder:

1. In the Jobs pane, select **Copy Job Folder(s)** from the (Select Action) list.
2. In the Details pane, select the folder to which you want to copy the selected job folders.
3. Select the folders from which to make copies. Selecting a job folder within the Jobs pane before step 1 will preselect that job for step 3.



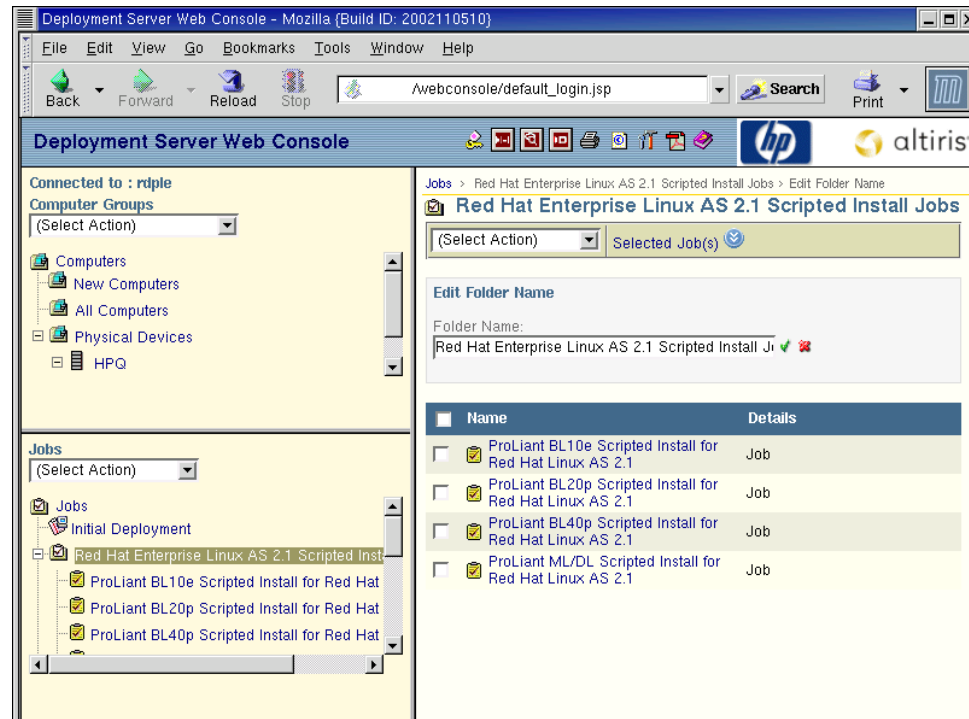
4. Click **Copy**.

IMPORTANT: The job folders in the Rapid Deployment Pack use long names to be descriptive. However, when attempting to copy these jobs, the name exceeds the 64-character limit imposed by the Web console and is truncated since Altiris places "Copy of" in front of the job name.

Renaming a Job Folder

To rename a job folder:

1. In the Jobs pane, click the folder.
2. In the Details pane, click the folder name.
3. In the Details pane, enter a descriptive name in the **Folder Name** field.



4. Click the green check mark icon at the end of the **Folder Name** field.

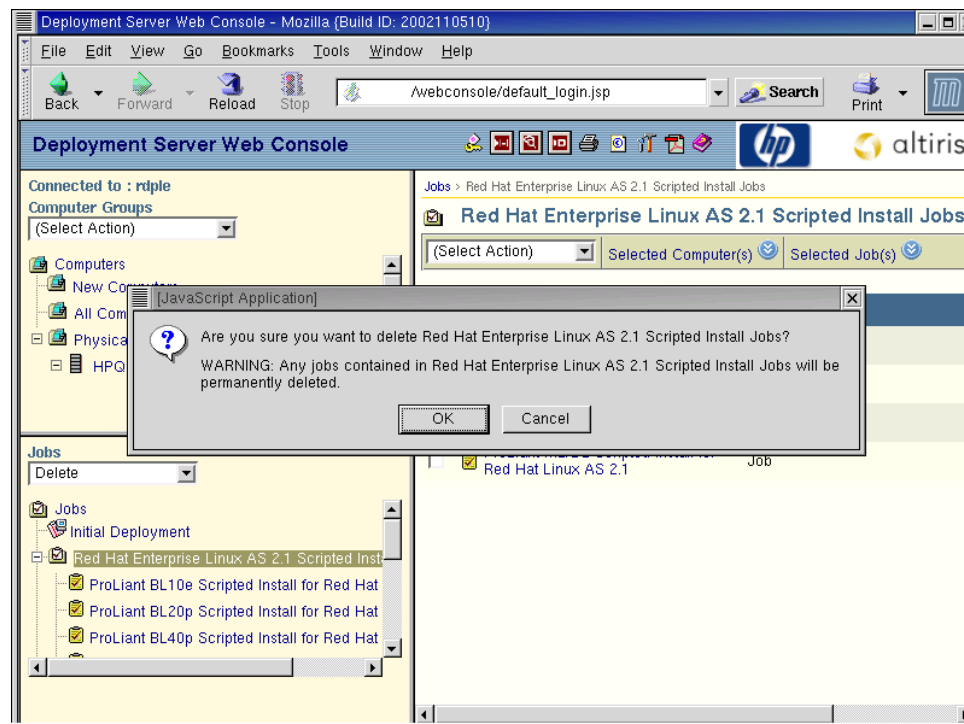
Deleting a Job Folder or Job

To delete a job folder or job:

1. From the Jobs pane, click the folder or job to highlight it.
2. From the Jobs pane, select **Delete** from the (Select Action) list.
3. Click **OK** when prompted to confirm the action.

IMPORTANT: Deleting a folder will delete all jobs within that folder.

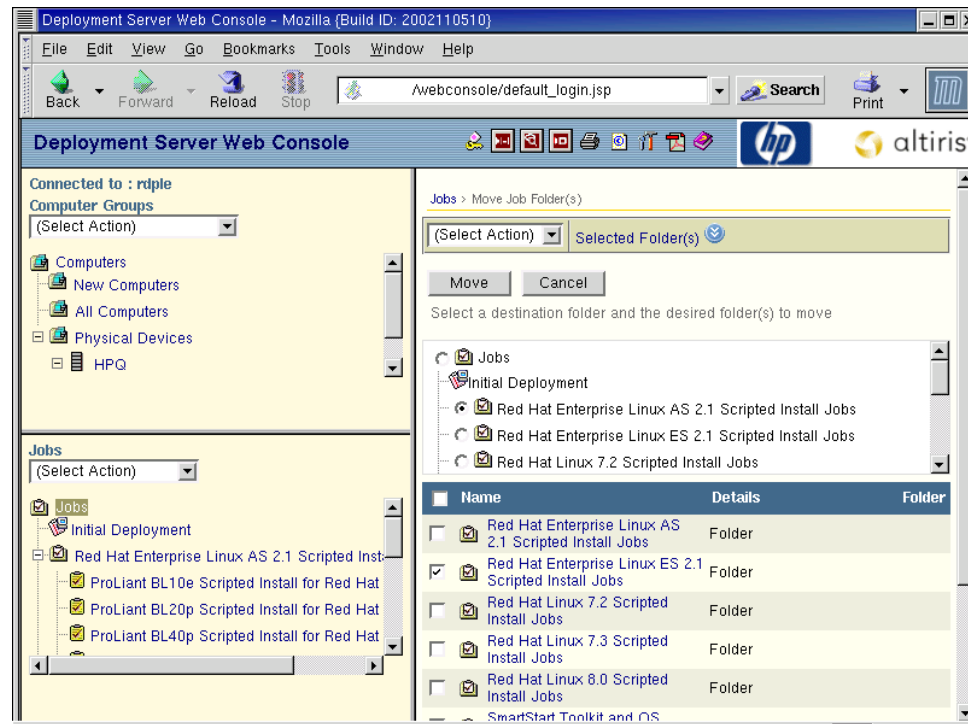
IMPORTANT: A job or folder that is deleted cannot be recovered.



Moving a Job Folder

To move a job folder:

1. In the Jobs pane, select **Move Job Folder(s)** from the (Select Action) list.
2. In the Details pane, select the folder to which you want to move the job folder.
3. Select the folders to move underneath the folder selected in step 2. Selecting a job folder within the Jobs pane before step 1 will preselect that job for step 3.

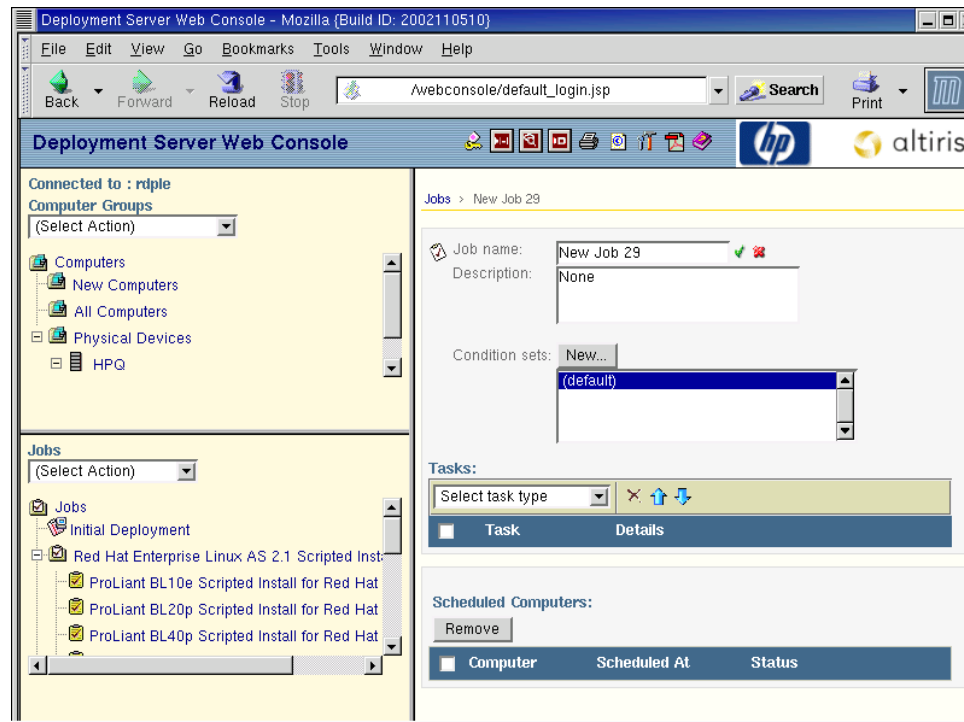


4. Click **Move**.

Adding a Job

To add a new job:

1. In the Jobs pane, click the **Jobs** top-level folder to create a new top-level job, or click a job folder to create a new job within the folder. This action highlights the folder name.
2. From the (Select Action) list, select **New Job**.
3. In the Details pane, enter a descriptive name in the **Job name** field and a job description in the **Description** field.

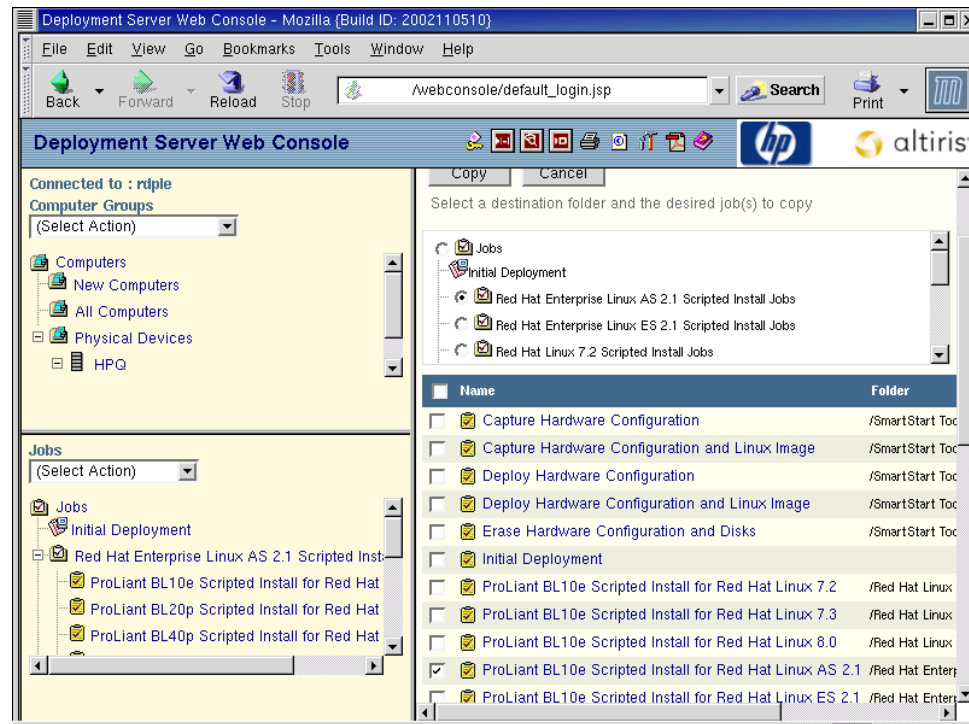


4. Click the green check mark icon at the end of the **Job name** field.

Copying a Job

To copy a job:

1. From the (Select Action) list, select **Copy Job(s)**.
2. In the Details pane, select the folder to which you want to copy the selected jobs.
3. Select the jobs from which to make copies. Selecting a single job within the Jobs pane before step 1, will preselect that job for step 3.



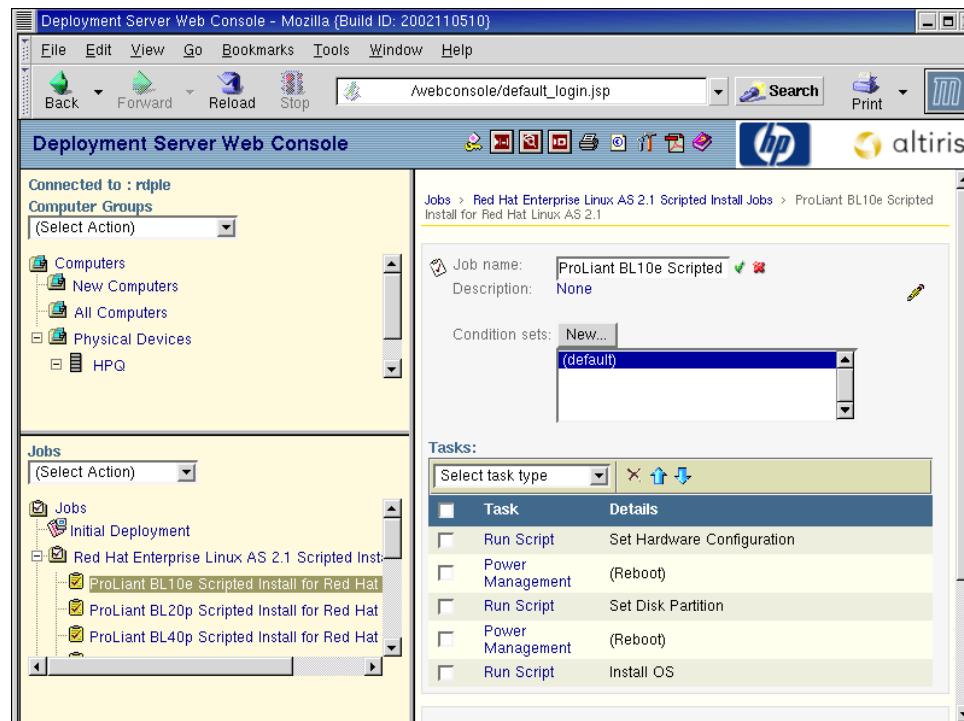
4. Click **Copy**.

IMPORTANT: The jobs in the Rapid Deployment Pack use long names to be descriptive. However, when attempting to copy these jobs, the name exceeds the 64-character limit imposed by the Web console and is truncated since Altiris places “Copy of” in front of the job name.

Renaming a Job

To rename a job:

1. In the Jobs pane, click the job to highlight the job name.
2. In the Details pane, click the job name or pencil icon.
3. Enter a descriptive name in the **Job name** field.

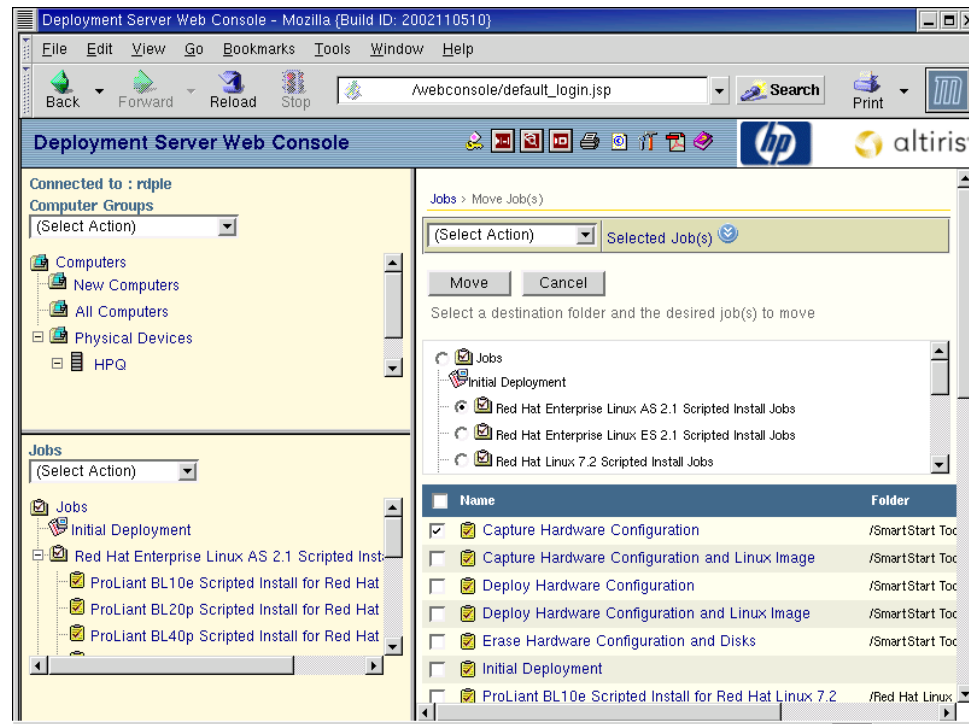


4. Click the green check mark icon at the end of the **Job name** field to submit your changes.

Moving a Job

To move a job:

1. In the Jobs pane, select **Move Job(s)** from the (Select Action) list.
2. In the Details pane, select the folder to which you want to move the job.
3. Select the jobs to move underneath the folder selected in step 2. Selecting a job within the Jobs pane before step 1 will preselect that job for step 3.

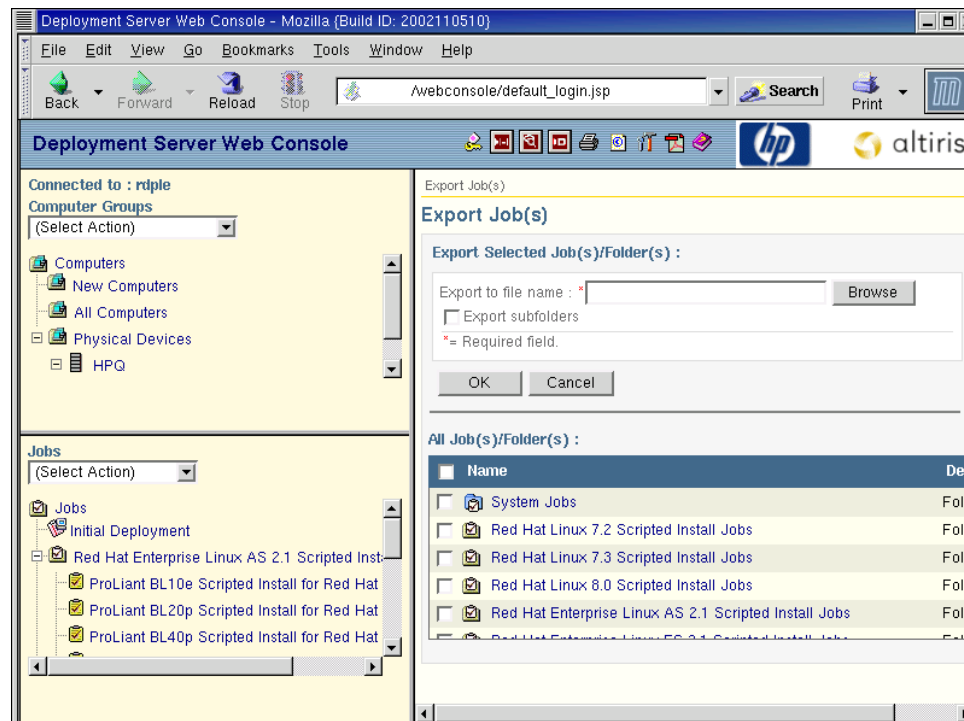


4. Click **Move**.

Exporting a Job or Folder

To export a job or a folder:

1. In the Jobs pane, select **Export Job(s)** from the (Select Action) list.
2. In the Details pane, click **Browse** to indicate a directory and job file, or type in the path and file name in the **Export to file name** field. Job files are usually denoted with the .bin extension.

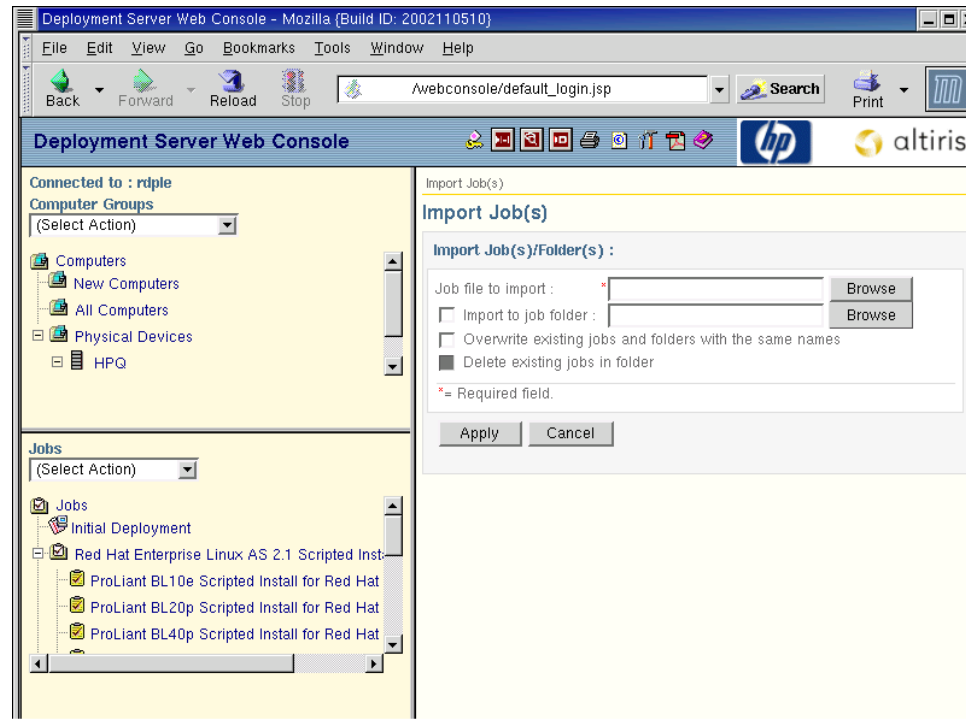


3. Select the **Export subfolders** checkbox if applicable for a folder.
4. Select the job or folder to export.
5. Click **OK**.

Importing a Job or Folder

To import a job or a folder:

1. Place the job file (.bin) onto the Deployment Server in a specified directory.
2. In the Jobs pane, select **Import Job(s)** from the (Select Action) list.
3. In the Details pane, click **Browse** to locate the directory and job file, or type in the path and file name in the **Job file to import** field. Job files are usually denoted with the .bin extension.



4. Select the checkboxes that apply.
5. Click **Apply**.

NOTE: The Deployment Server does not support the import of jobs exported from the Deployment Server running on a Windows operating system.

Customizing the ProLiant Integration Modules for Linux Deployment Server and NFS Server

Customizing the Red Hat Linux Kickstart File

You might want to customize the provided kickstart files to:

- Change default root or grub passwords
- Set a fixed IP address and hostname
- Change partitions, types, and sizes
- Change Linux packages that are installed
- Add errata kernel installation

For information about editing the kickstart files, refer to the *Red Hat Linux Customization Guide* located at <http://www.redhat.com>.

Refer to Chapter 3 of this guide for the location of the *ksfile=* variable within the provided scripted install jobs, and Chapter 4 for the kickstart file location on the NFS server. For each Linux distribution, there are several jobs and associated kickstart files for specific ProLiant models and families. If you want to make a change to the kickstart file for a particular server or type of server, copy, rename, and edit the kickstart file and the associated job to reference the new kickstart file.

Customizing the UnitedLinux Control File

You might want to customize the provided control files to:

- Change default root or grub passwords
- Set a fixed IP address and hostname
- Change partitions, types, and sizes
- Change Linux packages that are installed

For information on editing control files, refer to the AutoYast guide at <http://www.suse.de/~nashif/autoinstall/index.html>.

Refer to Chapter 3 of this guide for the location of the *ctlfile=* variable within the provided scripted install jobs, and Chapter 4 for the control file location on the NFS server. For each Linux distribution, there are several jobs and associated control files for specific ProLiant models and families. If you want to make a change to the control file for a particular server or type of server, copy, rename, and edit the control file and the associated job to reference the new control file.

Customizing the Hardware Configuration Settings

IMPORTANT: The hardware configuration files are not operating-system specific. The Linux scripted install jobs use these files. Changing the supplied files might have unwanted consequences.

You might want to customize the provided configuration files to:

- Enable or disable Advanced Server Recovery (ASR)
- Change the default boot order
- Explicitly set the RAID level or number of logical drives

For information about editing configuration files, refer to the SmartStart Scripting Toolkit User Guide or <http://www.hp.com/servers/sstoolkit>.

Refer to Chapter 3 of this guide for locations of the *hwrfile=* and the *aryfile=* variables within the provided scripted install jobs and the location of the physical file on the Deployment Server.

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